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ABSTRACT

This curriculum guide is intended to assist persons teaching a course in microcomputer applications in agriculture. (These applications are designed to be used on Apple IIe or TRS-80 microcomputers.) Addressed in the individual units of instruction are the following topics: microcomputer operating procedures; procedures for evaluating and selecting a microcomputer system; microcomputer applications in farm business management, animal science, crop science, horticulture, agricultural mechanics, and agribusiness. Each unit contains some or all of the following: performance objectives, suggested activities for teachers and students, information sheets, transparency masters, assignment sheets, job sheets, tests, and answers to the tests. (MN)

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# Microcomputer Applications in Agriculture

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MICROCOMPUTER APPLICATIONS
IN AGRICULTURE

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## MICROCOMPUTER APPLICATIONS
## IN AGRICULTURE

### SOFTWARE PROGRAMS

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Unit VI **Microcomputer Applications in Crop Science**

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Unit VII **Microcomputer Applications in Horticulture**

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# FOREWORD

The Mid-America Vocational Curriculum Consortium (MAVCC) was organized for the purpose of developing instructional material for eleven member states. Priorities for developing MAVCC material are determined annually based on the needs as identified by these states. One priority identified was *Microcomputer Applications in Agriculture.*

This publication is an exemplary product in that it is MAVCC's first computer-aided instructional package which, along with teacher and student manuals, includes transparencies and microcomputer software. It is designed to assist teachers in acquainting students with the microcomputer and its various applications in agriculture.

The success of this publication is due, in large part, to the capabilities of the personnel who worked with its development. The technical writer and software specialists have experience as teachers as well as with industry. Assisting them in their efforts were representatives of each of the member states who brought with them technical expertise and the experience related to the classroom and to the trade. To assure that the materials would parallel the industry environment and be accepted as a transportable basic teaching tool, organizations and industry representatives were involved in the developmental phases of the manual. Appreciation is extended to them for their valuable contributions to the manual.

Instructional materials in this publication are written in terms of student performance using measurable objectives. This is an innovative approach to teaching that accents and augments the teaching/learning process. Criterion referenced evaluation instruments are provided for uniform measurement of student progress. In addition to evaluating recall information, teachers are encouraged to evaluate the other areas including process and product as indicated at the end of each instructional unit.

It is the sincere belief of the MAVCC personnel and all those members who served on the agriculture committee that this instructional package will allow the students to become better prepared and more effective members of the work force.

Larry Barnhardt, Chairman
Board of Directors
Mid-America Vocational
Curriculum Consortium

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# PREFACE

The wide acceptance and use of computers in today's society and the resulting need for students to become computer literate has prompted the Mid-America Vocational Curriculum Consortium to enter the world of computer technology.

The first challenge in this area for MAVCC was the development of this publication, *Microcomputer Applications in Agriculture*. Designed to supplement a typical vocational agriculture course at either the secondary or post secondary level, these materials should allow the student to master the basic skills related to the operation, selection, and evaluation of microcomputers and software.

Altogether, fifteen programs have been developed for use with the nine units of instruction. The first three units are intended to be used as introductory information related to the use and selection of microcomputers. The remaining six units, Farm Business Management, Animal Science, Crop Science, Horticulture, Agricultural Mechanics, and Agribusiness are very similar in content. This was done intentionally so that the units may be used within the existing specialty areas. It is suggested that the student in crop science, for example, proceed through the standard crop science instruction, then learn about the ways microcomputers can be used by the person employed in a crop science occupation.

Because of the various microcomputer models currently being used in vocational agriculture programs, MAVCC was faced with the decision of what brands of equipment to address. Though the written information is appropriate for nearly any type of microcomputer, we selected Apple II (any of the Apple II compatible models) and Radio Shack (Models III or IV) as being the microcomputers for which our software was developed. It is hoped that we will be able to modify the software for other models at a later time; however, if you see a need for altering the programs, either for personal use or for other hardware, we invite you to do so.

Appreciation is extended to the committee of experts who represented the MAVCC member states as well as industry in the development of this publication. Going beyond the call of duty were Lon Moeller, Rick Foster, and Mark Zidon who developed and modified software for the application units. With them, Tom Stitt and Rose Roider of Southern Illinois University came to our aid in writing the software for use in Unit II and in putting the finishing touches on the software and adapting them for use on a Radio Shack TRS-80 microcomputer. After reviewing the programs which accompany this publication, we feel that you will not only appreciate their efforts, but be eager to put the materials into practice in your classroom.

As this material is used, it is hoped that the student performance will improve so the students will be better able to assume a role in their chosen occupation. Every effort has been made to make this publication basic, readable, and by all means, usable. Three vital parts of instruction have been intentionally omitted: motivation, personalization, and localization. These areas are left to the individual instructors who should capitalize on them. Only then will this publication become a vital part of the teaching-learning process.

In addition, we would appreciate your help. We check for content quality, spelling, and typographical errors many times in the development of a manual. It is still possible, however, for an error to show up in a publication. And, because of the newness of developing adjacent software, we have opened the possibility for even greater error. If you detect changes which need to be made, or if you have recommendations which will improve the quality of these or other materials, we welcome your input.

Ann Benson
Executive Director
Mid-America Vocational
Curriculum Consortium

# ACKNOWLEDGEMENTS

Appreciation is extended to those individuals who contributed their time and talent to the development of *Microcomputer Applications in Agriculture*.

The contents of this instructional package were planned and reviewed by the following members of the Mid-America Vocational Curriculum Consortium agriculture committee:

Steven Burhoe, Missouri
Richard Foster, Nebraska
Dan Gutshall, Kansas
Raymond Holt, Texas
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We also express appreciation to Tom Stitt, professor of agricultural education at Southern Illinois University and co-author of *Microcomputing in Agriculture*, and to Rose Roider and other staff members at S.I.U. for their assistance in developing software to accompany the job sheets in this book.

We extend a special thank you to Keith Carlson of Agri-Education, Inc., to Arlie Goforth, area manager of the Clyde Coop Association, to Gene Benson of Benson Custom Harvesting, to Willis Wilson and Steven Burhoe of Farmland Industries, and to Ron Nutsch of the Federal Land Bank of Wichita for representing business and industry on this committee.

Gratitude is expressed to the numerous agribusinesses and publishers who provided us with reference materials and to the Graphics Division of the Oklahoma State Department of Vocational and Technical Education for typing, providing artwork, and printing of this publication.

Thanks are also extended to Coordinator, Jane Huston, and to Mary Kellum and Dan Fulkerson for their assistance in editing and proofreading.

# USE OF THIS PUBLICATION

## Instructional Units

*Microcomputer Applications in Agriculture* includes nine units. Each instructional unit includes some or all of the basic components of a unit of instruction: performance objectives, suggested activities for teachers and students, information sheets, assignment sheets, job sheets, visual aids, tests, and answers to the test. Units are planned for more than one lesson or class period of instruction.

Careful study of each instructional unit by the teacher will help to determine:

A. The amount of material that can be covered in each class period
B. The skills which must be demonstrated

    1. Supplies needed
    2. Equipment needed
    3. Amount of practice needed
    4. Amount of class time needed for demonstrations

C. Supplementary materials such as pamphlets or filmstrips that must be ordered
D. Resource people who must be contacted

## Objectives

Each unit of instruction is based on performance objectives. These objectives state the goals of the course, thus providing a sense of direction and accomplishment for the student.

Performance objectives are stated in two forms: unit objectives, stating the subject matter to be covered in a unit of instruction; and specific objectives, stating the student performance necessary to reach the unit objective.

Since the objectives of the unit provide direction for the teaching-learning process, it is important for the teacher and students to have a common understanding of the intent of the objectives. A limited number of performance terms have been used in the objectives for this curriculum to assist in promoting the effectiveness of the communication among all individuals using the materials.

Reading of the objectives by the student should be followed by a class discussion to answer any questions concerning performance requirements for each instructional unit.

Teachers should feel free to add objectives which will fit the material to the needs of the students and community. When teachers add objectives, they should remember to supply the needed information, assignment and/or job sheets, and criterion tests.

**Suggested Activities for the Instructor**

Each unit of instruction has a suggested activities sheet outlining steps to follow in accomplishing specific objectives. Duties of instructors will vary according to the particular unit; however, for best use of the material they should include the following: provide students with objective sheet, information sheet, assignment sheets, and job sheets; preview filmstrips, and arrange for resource materials and people; discuss unit and specific objectives and information sheet; demonstrate procedures in job sheets; give test. Teachers are encouraged to use any additional instructional activities and teaching methods to aid students in accomplishing the objectives.

**Information Sheets**

Information sheets provide content essential for meeting the cognitive (knowledge) objectives in the unit. The teacher will find that the information sheets serve as an excellent guide for presenting the background knowledge necessary to develop the skill specified in the unit objective.

Students should read the information sheets before the information is discussed in class. Students may take additional notes on the information sheets.

**Transparency Masters**

Transparency masters provide information in a special way. The students may see as well as hear the material being presented, thus reinforcing the learning process. Transparencies may present new information or they may reinforce information presented in the information sheets. They are particularly effective when identification is necessary.

Transparencies direct the class's attention to the topic of discussion. They should be left on the screen only when topics shown are under discussion.

**Assignment Sheets**

Assignment sheets give direction to study and furnish practice for paper and pencil activities to develop the knowledge which is a necessary prerequisite to skill development. These may be given to the student for completion in class or used for homework assignments. Answer sheets are provided as necessary, and may be used by the student and/or teacher for checking student progress.

**Job Sheets**

Job sheets are an important segment of each unit and software has been developed to provide the necessary application programs which are needed to accomplish the skills. The instructor should be able to demonstrate the skills outlined in the job sheets. Procedures outlined in the job sheets give direction to the skill being taught and allow both student and teacher to check student progress toward the accomplishment of the skill. Job sheets provide a ready outline for students to follow if they have missed a demonstration. Job sheets also furnish potential employers with a picture of the skills being taught and the performances which might reasonably be expected from a person who has had this training.

### Test and Evaluation

Paper-pencil and performance tests have been constructed to measure student achievement of each objective listed in the unit of instruction. Individual test items may be pulled out and used as a short test to determine student achievement of a particular objective. This kind of testing may be used as a daily quiz and will help the teacher spot difficulties being encountered by students in their efforts to accomplish the unit objective. Test items for objectives added by the teacher should be constructed and added to the test.

### Test Answers

Test answers are provided for each unit. These may be used by the teacher and/or student for checking student achievement of the objectives.

MICROCOMPUTER APPLICATIONS IN AGRICULTURE

## INSTRUCTIONAL/TASK ANALYSIS

| JOB TRAINING: What The Worker Should Be Able to Do (Psychomotor) | RELATED INFORMATION: What The Worker Should Know (Cognitive) |
|---|---|

### UNIT I: ORIENTATION

| | |
|---|---|
| | 1. Terms and definitions |
| | 2. Reasons for studying computer applications in agriculture |
| | 3. Major types of computers |
| | 4. General uses of the microcomputer |
| | 5. Common uses of the microcomputer in agriculture |
| | 6. Sources of microcomputer information |
| 7. Compile a list of resources dealing with microcomputers | |
| 8. Identify areas in agriculture where the computer is used | |
| 9. Compile a list of computerized equipment being used in agriculture | |

### UNIT II: OPERATING PROCEDURES FOR THE MICROCOMPUTER

| | |
|---|---|
| | 1. Terms and definitions |
| | 2. Major components of the microcomputer |
| | 3. Processing system components |
| | 4. Parts of the Apple IIe keyboard |
| | 5. Apple introductory system commands |
| | 6. Parts of the Radio Shack keyboard |
| | 7. Radio Shack introductory system commands |
| | 8. Care and maintenance of the microcomputer |

## INSTRUCTIONAL/TASK ANALYSIS

| JOB TRAINING: What The Worker Should Be Able to Do (Psychomotor) | RELATED INFORMATION: What The Worker Should Know (Cognitive) |
|---|---|
| | 9. Care and maintenance of floppy diskettes |
| | 10. Factors to consider before duplicating software programs |
| | 11. System compatibilities |
| 12. Load and run a program using introductory system commands | |
| 13. Load and run a program using other system commands | |
| 14. Load and run an application program (average daily gain) | |
| 15. Load and run an application program (vehicle cost) | |
| 16. Load and run an application program (checkbook balancer) | |

### UNIT III: EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM

| | |
|---|---|
| | 1. Terms and definitions |
| | 2. Major types of software packages |
| | 3. Factors to consider when evaluating and selecting software |
| | 4. Factors to consider when evaluating and selecting hardware |
| | 5. Types of printers |
| | 6. Factors to consider when evaluating and selecting a printer |
| | 7. Other factors to consider when selecting a microcomputer |
| 8. Determine specific needs for an agricultural operation | |

## INSTRUCTIONAL/TASK ANALYSIS

| JOB TRAINING: What The Worker Should Be Able to Do (Psychomotor) | RELATED INFORMATION: What The Worker Should Know (Cognitive) |
|---|---|
| 9. Evaluate software for the microcomputer system | |
| 10. Evaluate hardware for the microcomputer system | |

### UNIT IV: MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT

| | |
|---|---|
| | 1. People who use the microcomputer in farm business management |
| | 2. Reasons for using a microcomputer |
| | 3. Areas of farm business management and appropriate software |
| | 4. Sources of microcomputer software for farm business management |
| 5. Determine specific sources of farm business management software | |
| 6. Run an application program related to farm business management (breakeven feeder analysis) | |
| 7. Run an application program related to farm business management (accelerated cost recovery program) | |

### UNIT V: MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE

| | |
|---|---|
| | 1. Types of livestock for which programs might be developed |
| | 2. People who use the microcomputer in animal science applications |
| | 3. Reasons for using a microcomputer in animal science |

## INSTRUCTIONAL/TASK ANALYSIS

JOB TRAINING: What The Worker Should Be Able to Do
(Psychomotor)

RELATED INFORMATION: What The Worker Should Know
(Cognitive)

4. Examples of software which might be used in animal science
5. Sources of microcomputer software for animal science
6. Determine specific sources of animal science software
7. Run an application program related to animal science (lamb yield grade)
8. Run an application program related to animal science (dairy cow purchase analysis)

## UNIT VI: MICROCOMPUTER APPLICATIONS IN CROP SCIENCE

1. Types of crops for which programs might be developed
2. People who use the microcomputer in crop science applications
3. Reasons for using a microcomputer in crop science
4. Examples of software which might be used in crop science
5. Sources of microcomputer software for crop science
6. Determine specific sources of crop science software
7. Run an application program related to crop science (crop comparison)
8. Run an application program related to crop science (grain bin capacity analysis)

## INSTRUCTIONAL/TASK ANALYSIS

JOB TRAINING: What The Worker Should Be Able to Do (Psychomotor)

RELATED INFORMATION: What The Worker Should Know (Cognitive)

### UNIT VII: MICROCOMPUTER APPLICATIONS IN HORTICULTURE

1. [illegible] of horticulture for which programs might be developed
2. People who use the microcomputer in horticulture applications
3. Reasons for using a microcomputer in horticulture
4. Software programs which might be used in horticulture
5. Sources of microcomputer software
6. Determine specific sources of horticulture software
7. Run an application program related to horticulture (plant inventory)

### UNIT VIII: MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS

1. Areas in agricultural mechanics where microcomputers might be used
2. People who use the microcomputer in agricultural mechanics applications
3. Reasons for using a microcomputer in agricultural mechanics applications
4. Software programs which might be used in agricultural mechanics
5. Sources of microcomputer software
6. Determine specific sources of agricultural mechanics software

## INSTRUCTIONAL/TASK ANALYSIS

JOB TRAINING: What The Worker Should Be Able to Do (Psychomotor)

RELATED INFORMATION: What The Worker Should Know (Cognitive)

7. Run an application program related to agricultural mechanics (calculating board feet)
8. Run an application program related to agricultural mechanics (rafter dimensions)

### UNIT IX: MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS

1. Agribusiness career fields where a microcomputer is used
2. Reasons for using a microcomputer in agribusiness
3. Ways the microcomputer can improve the profit margin
4. Ways the computer is used in agribusiness
5. Sources of microcomputer software

6. Determine specific sources of agribusiness software
7. Run an application program related to agribusiness (computing interest)
8. Run an application program related to agribusiness (take home pay)

MICROCOMPUTER APPLICATIONS IN AGRICULTURE

## SYSTEM COMMANDS

There are four groups of system commands which are used to support the introductory system commands that are given in the information sheet in Unit II. They are functional commands, fundamental commands, loop commands, and data commands. Each command below is categorized in one of these groups and is defined for use in teaching the application program on other system commands (Job Sheet #2-#5) in Unit II — Operating Procedures for the Microcomputer.

### Functional Commands

(NOTE: Functional commands direct the computer to perform a specific function in handling information which has been inputted.)

LIST — Allows the programmer to look at lines that are currently in the computer's memory

NEW — Erases the program and variables that are currently in the memory of the computer; it is used only when the user has finished with a program and has it properly stored on tape or disk or when the program is of no further value

(NOTE: The NEW command should be executed very carefully.)

SAVE — Stores the program currently in the computer's memory on tape or disk; the SAVE command may be a specific word such as **SAVE**

LOAD — Transfers the program from the storage unit (usually a tape) into the computer's memory for use or modification; LOAD statement may be just the single word **LOAD**

### Fundamental Commands

(NOTE: Fundamental commands are used frequently in simple as well as complex programs.)

PRINT — Instructs the computer to print the message specified

INPUT — Allows the person operating the program to put information into the computer

LET — Can be used to set a variable to a value in the form of a number (like 7) or letter (like C) or a formula (like C = A + B)

(NOTE: Some microcomputers do not require the word LET.)

REM — Allows the insertion of a comment in the program listing; does not show up in the execution of the program

END — Stops the program and tells the computer there are no further statements to be run in the program; it must be the last statement of execution in the BASIC program

IF. . . THEN (IF THEN. . . ELSE, TRS-80) — Provides for the evaluation of a condition or conditions and takes different actions based on the outcome

## Loop Commands

(NOTE: Loop commands are used to perform specified operations more than one time.)

GOTO (GO TO) — Allows the program to send the computer to a line out of numerical order

GOSUB/RETURN — A specialized form of the GOTO command; it remembers where it came from, and when it has completed its task and when a RETURN command is included, the computer will automatically return to the next line in the program immediately following the GOSUB statement from which it came

ON GOTO (TRS-80) — Sends the computer to one of line numbers specified

ON GOSUB - RETURN (TRS-80) — Sends the computer to one of subroutines specified

FOR...NEXT — Provided to allow the programmer to use a variable as a counter; programmer must establish the variable name, identify the starting value, limit the count, and establish the quantity to be added during each cycle

## Data Commands

(NOTE: Data commands are used when variables are stored within the program.)

DATA — Used to hold information that will be used to fill variables in a READ command; any type of information may be stored if separated by commas

READ — Instructs the computer to READ the DATA values stored in the program to fill variables

RESTORE — Tells the computer to return the first DATA statement in the program; reads the DATA statements in the order that they appear and moves automatically to the next item until all stored values have been used

(NOTE: Failure to do this will get an "OUT OF DATA" error.)

DIM A$(#) or DIM A(#) — Reserves space in memory for the arrays specified

(NOTE: $ stands for string [text]; A without $ represents numbered variables; # represents an amount such as 1, 2, 3 . . .)

## GLOSSARY

Arithmetic/logic unit — Major component of the central processing unit which performs all arithmetic and logical operations under the direction of the control unit

Auxiliary storage device — Supplementary means for storing data

BASIC — Beginner's All-purpose Symbolic Instruction Code; Programming language developed at Dartmouth College for use in academic computing, but widely used on microcomuters

Batch processing — The accumulation and processing of data as a group

Bit — Smallest unit of information that can be recognized by a computer

Boot the disk — Process of adding the DOS commands to the BASIC in Apple II

Byte — The unit of measure of a computer's memory; normally holds one character (usually 8 bits)

Cassette tape cartridge — Two reels of magnetic tape enclosed in a small plastic or metal cartridge that is used to store and retrieve data

Cathode ray tube (CRT) — Vacuum tube with a screen and controlled beam of electrons that may be used either as a display or storage device or both

Central processing unit (CPU) — Major component of a computer system responsible for processing all data handled by the system; consists of the control and arithmetic/logic unit

Character — Single decimal value, letter of the alphabet, or space

Chips — Miniature integrated circuits which have replaced transistors

Computer — An electronic device capable of receiving and storing data, performing prescribed operations on that data, and reporting the results of those operations

Controller card — Small circuit board used to provide numerous functions depending on its purpose

Cursor — Character which indicates position on screen; is usually represented by a blinking square or underline

Data — Collection of numbers and/or words to be processed

Data base — Comprehensive data file containing information presented in a format which is applicable to user's needs; available when needed

Disk operating system (DOS) — Program responsible for the housekeeping and communications between the disk storage device and the computer

Documentation — Illustrations and explanations that include both general information needed by the user of the program and the specific information needed by the computer operator or the computer programmer if the program later needs updating

Emulation — Technique using software or microprogramming in which one computer is made to behave exactly like another computer

Floppy diskette — Oxide-coated reusable plastic disk enclosed in a protective covering (paper or plastic envelope) that is used to magnetically store and load information

Graphics — A picture, map, or graph used for illustration; displayed by a computer as on a monitor or printer

Hard copy — Printed output from an information system

Hard disk — Magnetized circular plate, which is inflexible and where data can be read onto and/or written from

Hardware — Physical parts of the computer

Hello — Name for the greeting program

Information processing — Manipulation of factual matter of all kinds for the purpose of producing a desired answer or result

Input — Means by which data from keyboards, tapes, hard disks, and floppy diskettes are entered into an information processing system

I/O — Trade term which refers to input/output devices

Interface — Controller for input/output which can be parallel (8 bits at a time) or serial (1 bit at a time)

K — Symbol denoting 1,024 units (bytes) of information

Memory — Storage area of the computer which holds programs and data being processed

Menu — List of choices or alternatives for user action; often a list of program options

Modem — Device that converts data into impulses and transmits them over telephone lines from the terminal to the computer and vice versa

Output — Means by which information is reported from computer storage in a form that can be understood by human beings or in a form suitable for use as input for another computer system

Peripheral device — Device connected to a computer to provide communication (input/output) or auxiliary functions

Printer — Computer output device that produces printed copy

Program — Complete set of instructions that directs the computer and coordinates the operation of the various computer components

Programming languages — Languages used in writing programs to direct processing steps carried out by a computer

Random Access Memory (RAM) — Main storage areas used with microcomputers, minicomputers, and text-editing equipment into which data can be written or read

Read Only Memory (ROM) — Storage areas used with microcomputers, minicomputers, and text-editing equipment that permit data to be read from them because they are permanently wired to perform one function or contain specific data

Software — Programming aids frequently supplied by the computer manufacturers to assist the purchaser in efficiently operating the equipment

Storage — Retention of data so that data can be obtained at a later time

Syntax — Rules governing sentence structure in a language or statement structure in a language such as that of a compiler program

System commands — Commands used in running the disk operating system (DOS)

Tutorial — Written instruction providing practical information about a specific subject

Word processing system — The combination of specific procedures, methods, equipment, and people designed to accomplish the transition of a written, verbal, or recorded word distributed to its ultimate use

## REFERENCES

(NOTE: The following is an alphabetical list of references used in completing this text.)

*Agricultural Computing Source Book.* St. Louis, MO: Doane Western, Inc., 1984.

Boyce, Jefferson C. *Microprocessor and Microcomputer Basics.* Englewood Cliffs, NJ: Prentice-Hall, Inc., 1979.

Denison, Ervin L. *Principles of Horticulture.* New York: MacMillan Publishing Co., Inc., 1979.

Hodgens, Jim, and Leland Myers. *Farm Business Management, Year One.* Stillwater, OK: Oklahoma State Board of Vocational and Technical Education, 1979.

Jennings, Carol Ann and Sandy McDonald. *Information Processing.* Stillwater, OK: Mid-America Vocational Curriculum Consortium, 1981.

Phipps, Lloyd J. *Mechanics in Agriculture.* Danville, IL: The Interstate Printers and Publishers, Inc., 1977.

Poole, Lon, Martin McNiff, and Steven Cook. *Apple II User's Guide.* Berkeley, CA: OSBORN/McGraw-Hill Book Co., 1981.

Richardson, William B. and Gary E. Moore. *Working in Horticulture.* New York: Gregg Division, McGraw-Hill Book Company, 1980.

Rush, Michael G. and Richard M. Foster. *Agricultural Mechanics.* Boise, ID: Idaho State Board of Vocational Education, 1981.

Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.

Stone, Archie A., Marcella L. Stone, and Harold E. Gulvin. *Agribusiness and Industry.* Danville, IL: The Interstate Printers and Publishers, Inc., 1980.

Tocci, Ronald J. and Lester P. Laskowski. *Microprocessors and Microcomputers.* Second Edition. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1982.

*TRS-80 Model III Disk System Owner's Manual.* Fort Worth, TX: Tandy Corp., 1980.

## ADDITIONAL REFERENCES

(NOTE: This is an alphabetical list of materials which would be beneficial as supplementary teaching aids.)

Agri-Education, Inc., 815 Shakespeare, Stratford, IA 50249.

(NOTE: Agri-Education, Inc., is a software distributor of agricultural computer programs designed for educational purposes.)

Beasley, Jack O. *Microcomputers on the Farm*. Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

Career Aids, Inc., 8950 Lurline Avenue, Dept. TE, Chatsworth, CA 91311.

(NOTE: A catalog entitled, *Multimedia Materials for Occupational, Vocational, and Career Education,* may be obtained by writing to the above address. This catalog provides a complete listing of supplementary materials which may be used in teaching microcomputer use.)

Jennings, Carol Ann. *Basic Programming*. Stillwater, OK: Mid-America Vocational Curriculum Consortium, 1982.

Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture*. Reston, VA: Reston Publishing Co., Inc., 1984.

Microcomputer Programs in Agriculture. Vocational Agriculture Science, University of Illinois, 1401 S. Maryland Drive, Urbana, IL 61801.

(NOTE: A series of 16 microcomputer programs are available for the Apple II Plus, TRS-80 Model III, and Commodore Pet machines. Write to the above address for more information.)

# ORIENTATION

## UNIT OBJECTIVE

After completion of this unit, the student should be able to match major types of computers with their characteristics, list sources of microcomputer information, and identify areas in agriculture where the microcomputer is used. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Match terms related to microcomputer applications in agriculture with their correct definitions.
2. Select reasons for studying computer applications in agriculture.
3. Match major types of computers with their characteristics.
4. List five general uses of the microcomputer.
5. Select common uses of the microcomputer in agricultural occupations.
6. List sources of microcomputer information.
7. Compile a list of resources dealing with microcomputers.
8. Identify areas in agriculture where the computer is used.
9. Compile a list of computerized equipment being used in agriculture.

## ORIENTATION
## UNIT I

### SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Order film "Agriculture in the Year 2000" from your local Production Credit Association and show to class.

VI. Teach history of the computer.

VII. Begin putting together a reference library for student use.

VIII. Have students locate articles on computer uses in agriculture and report on these uses in class.

IX. Have students contact computer vendors for information on agriculture software and discuss with class.

X. Have students interview a local farmer, rancher or agribusiness person who uses a microcomputer, and give a short report to class. Encourage students to discuss the importance of the computer in relation to the areas in which it is used.

XI. Let students play games on the microcomputer to build their interest.

XII. Invite a local computer dealer or agribusiness computer user to class to discuss the need for students to develop competencies in computer use and to understand microcomputer applications in agriculture.

(NOTE: It is suggested that the dealer invited be actively involved in using agricultural software.)

XIII. Have a mini-trade show to demonstrate various uses of the microcomputer in agriculture.

XIV. Give test.

XV. Reteach if necessary.

### INSTRUCTIONAL MATERIALS

I. Included in this unit:

A. Objective sheet

## SUGGESTED ACTIVITIES

- B. Information sheet
- C. Transparency Master 1 — Major Types of Computers
- D. Assignment sheets
    - 1. Assignment Sheet #1 — Compile a List of Resources Dealing with Microcomputers
    - 2. Assignment Sheet #2 — Identify Areas in Agriculture Where the Computer is Used
    - 3. Assignment Sheet #3 — Compile a List of Computerized Equipment Being Used in Agriculture
- E. Test
- F. Answers to test

II. References:

- A. Jennings, Carol Ann and Sandy McDonald. *Information Processing.* Stillwater, OK: Mid-America Vocational Curriculum Consortium, 1981.
- B. Tocci, Ronald J. and Lester P. Laskowski. *Microprocessors and Microcomputers.* Second Edition. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1982.

III. Additional references:

- A. Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.
- B. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984.
- C. Beasley, Jack O. *Microcomputers on the Farm.* Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

# ORIENTATION
# UNIT I

## INFORMATION SHEET

I. Terms and definitions

A. Batch processing — The accumulation and processing of data as a group

B. Cassette tape cartridge — Two reels of magnetic tape enclosed in a small plastic or metal cartridge that is used to store and retrieve data

C. Cathode ray tube (CRT) — Vacuum tube with a screen and controlled beam of electrons that may be used either as a display or storage device or both

(NOTE: This is commonly referred to as the monitor.)

D. Computer — An electronic device capable of receiving and storing data, performing prescribed operations on that data, and reporting the results of those operations

Examples: Mainframe, minicomputer, and microcomputer

E. Data — Collection of numbers and/or words to be processed

F. Data base — Comprehensive data file containing information presented in a format which is applicable to user's needs; available when needed

G. Floppy diskette — Oxide-coated reusable plastic disk enclosed in a protective covering (paper or plastic envelope) that is used to magnetically store and load information

H. Hard disk — Magnetized circular plate, which is inflexible and where data can be read onto and/or written from

I. Hardware — Physical parts of the computer

J. Information processing — Manipulation of factual matter of all kinds for the purpose of producing a desired answer or result

K. Input — Means by which data from keyboards, tapes, hard disks, and floppy diskettes are entered into an information processing system

L. I/O — Trade term which refers to input/output devices

M. Output — Means by which information is reported from computer storage in a form that can be understood by human beings or in a form suitable for use as input for another computer system

N. Software — Programming aids which assist the computer user in efficiently operating the equipment

## INFORMATION SHEET

- O. Storage — Retention of data so that data can be obtained at a later time

II. Reasons for studying computer applications in agriculture

- A. Computers are used extensively in agriculture

  (NOTE: 80% of agricultural occupations use computers.)

- B. Creates greater efficiency thus allowing better use of time
- C. Can perform jobs that otherwise would be difficult or too tedius for the average person

III. Major types of computers and their characteristics (Transparency 1)

- A. Mainframe

  Examples: AGSTAR and AGNET

  1. Magnetic tapes, disks, and CRT terminals are primary means of input but can be supported by other input devices
  2. Can support large data bases
  3. Can be accessed by many users at the same time
  4. Can support many input devices at one time
  5. Usually supported by smaller computers that handle input, storage, and output
  6. Can be priced in millions

- B. Minicomputer

  1. Smaller than a mainframe in the amount of data it can handle
  2. Limited as to number of users that can access it at one time
  3. Typewriter-like keyboard is usually primary means of input but can be supported by other input systems
  4. Printer and/or monitor serve as primary output device
  5. Can utilize tape cassettes, floppy diskettes, or hard disks
  6. Usually priced from $10,000.00 to $250,000.00

## INFORMATION SHEET

C. Microcomputer

1. Smaller than a mainframe and minicomputer in the amount of data it can process
2. Usually can be accessed by only one user at a time
3. Most have monitor as primary output device
4. Typewriter-like keyboard is primary means of input
5. Most have an auxiliary storage device which utilizes a cassette tape cartridge or magnetic floppy diskette
6. Price is usually less than $5,000.00

   Examples: Radio Shack, Apple, Wang, Texas Instrument, IBM, and Commodore

D. Electronic calculator

1. Hand held and portable
2. Has prewired functions
3. Price ranges from $5 to $350
4. Some models can accept stored programs

   (NOTE: These are referred to as programmable calculators.)
5. Many will support small printers for output

IV. General uses of the microcomputer

A. Accounting

1. General ledger
2. Budgeting
3. Inventory
4. Enterprise analysis
5. Cost analysis
6. Account payables/receivables

INFORMATION SHEET

B. Data processing

  1. Files

     (NOTE: These are a list of data unique to a specific application.)

  2. Addresses

  3. Sorting and analyzing data

C. Word processing

  1. Letter writing

  2. Storage of documents

     Example: Making labels

  3. Editing

D. Calculating formulas and equations

E. Mechanical control devices

   Examples: Grain dryers, inventory robot controllers, auger controllers

V. Common uses of the microcomputer in agricultural occupations

A. Financial records

B. Production records

C. Computerized livestock feeding programs

D. Computerized equipment

   Examples: Grain monitors, combines, tractors

E. Tax management

F. Chemical application

G. Computer assisted instruction in vocational agriculture

H. Ag engineering applications

I. Research

## INFORMATION SHEET

VI. Sources of microcomputer information

(NOTE: Refer to tab marked "Resource List".)

A. Microcomputer dealers

B. Software companies

C. Hardware manufacturers

D. Vocational agriculture instructors

E. Agricultural magazines/newsletters

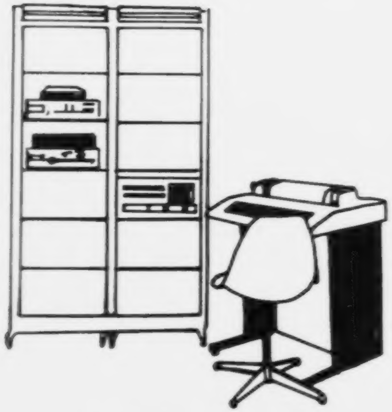
F. Computer magazines

G. Local extension/university personnel

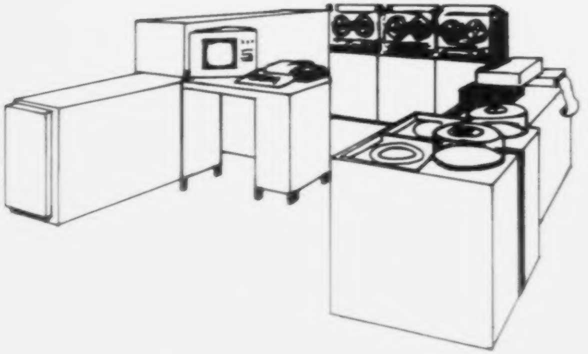
H. People and businesses that use a microcomputer

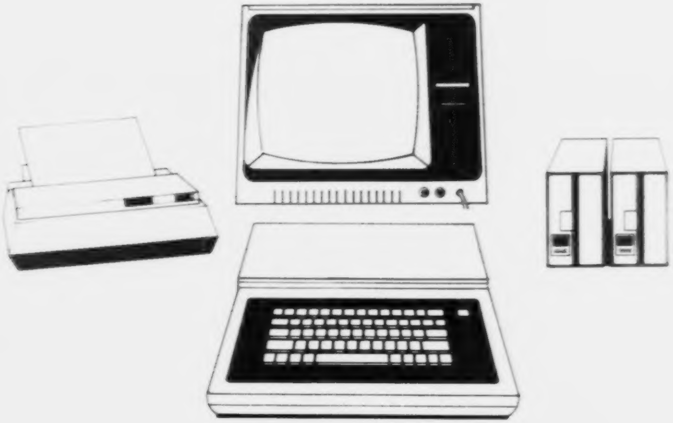
# Major Types of Computers

Minicomputer

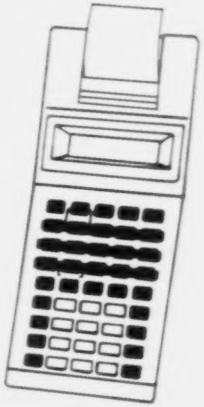


Mainframe





Microcomputer



Electronic Calculator

# ORIENTATION
# UNIT I

## ASSIGNMENT SHEET #1 — COMPILE A LIST OF RESOURCES DEALING WITH MICROCOMPUTERS

Directions: Compile a list of businesses, individuals, or other resources that deal with microcomputers. Include names, addresses, and pertinent information about them. Do not forget to include local sources of information.

(NOTE: Review objective VI for assistance in completing this assignment.)

| NAMES | ADDRESSES | PERTINENT INFORMATION |
|---|---|---|
| | | |

# ORIENTATION
# UNIT I

## ASSIGNMENT SHEET #2 — IDENTIFY AREAS IN AGRICULTURE WHERE THE COMPUTER IS USED

Part A

Directions: List areas in agriculture where the computer is used. Include the task(s) it performs and describe the effect(s) on agriculture.

(NOTE: Use the form provided on the back of this page to complete the assignment.)

## ASSIGNMENT SHEET #2

| Area | Task(s) | Effect(s) |
|---|---|---|
| Example: Crops | Calculate formulas for fertilizers to increase growth and production | Better crop yield |

## ASSIGNMENT SHEET #2

Part B

Directions: Answer the following questions concerning the effects of the computer on agriculture.

1. Which of the effects listed do you consider most beneficial to agriculture? Why?

   ______________________________________________

   ______________________________________________

   ______________________________________________

   ______________________________________________

2. Do you feel any effects listed have proved to be detrimental to agriculture? Why?

   ______________________________________________

   ______________________________________________

   ______________________________________________

   ______________________________________________

3. What effects (changes) do you foresee for the future based on the use of computers in agriculture?

   ______________________________________________

   ______________________________________________

   ______________________________________________

   ______________________________________________

ORIENTATION
UNIT I

## ASSIGNMENT SHEET #3 — COMPILE A LIST OF COMPUTERIZED EQUIPMENT BEING USED IN AGRICULTURE

Part A

Directions: List types of computerized equipment being used in agriculture. Include where and how the equipment is used and the effects on agriculture.

(NOTE: Use the form provided on the back of this page to complete the assignment.)

## ASSIGNMENT SHEET #3

| Type of Equipment | Where It Is Used | How It Is Used | Effect(s) |
|---|---|---|---|
|  |  |  |  |

## ASSIGNMENT SHEET #3

Part B

Directions: Answer the following questions concerning the effects of computerized equipment on agriculture.

1. Which of the effects listed do you consider most beneficial to agriculture? Why?

   ____________________

   ____________________

   ____________________

   ____________________

2. Do you feel any effects listed have proved to be detrimental to agriculture? Why?

   ____________________

   ____________________

   ____________________

   ____________________

3. What effects (changes) do you foresee for the future based on the use of computerized equipment in agriculture?

   ____________________

   ____________________

   ____________________

   ____________________

ORIENTATION
UNIT I

NAME ____________________

TEST

1. Match the terms on the right with their correct definitions.

_____a. Oxide-coated reusable plastic disk enclosed in a protective covering (paper or plastic envelope) that is used to magnetically store and load information

_____b. Collection of numbers and/or words to be processed

_____c. An electronic device capable of receiving and storing data, performing prescribed operations on that data, and reporting the results of those operations

_____d. Retention of data so that data can be obtained at a later time

_____e. Physical parts of the computer

_____f. Two reels of magnetic tape enclosed in a small plastic or metal cartridge that is used to store and retrieve data

_____g. Trade term which refers to input/output devices

_____h. Comprehensive data file containing information presented in a format which is applicable to user's needs; available when needed

_____i. Manipulation of factual matter of all kinds for the purpose of producing a desired answer or result

_____j. The accumulation and processing of data as a group

1. Data base
2. Storage
3. I/O
4. Output
5. Floppy diskette
6. Computer
7. Data
8. Batch processing
9. Input
10. Hardware

## TEST

______k. Magnetized circular plate, which is inflexible and where data can be read onto and/or written from

______l. Means by which data from keyboards, tapes, hard disks, and floppy diskettes are entered into an information processing system

______m. Programming aids which assist the computer user in efficiently operating the equipment

______n. Vacuum tube with a screen and controlled beam of electrons that may be used either as a display or storage device or both

______o. Means by which information is reported from computer storage in a form that can be understood by human beings or in a form suitable for use as input for another computer system

11. Software
12. Information processing
13. Hard disk
14. Cassette tape cartridge
15. Cathode ray tube

2. Select reasons for studying computer applications in agriculture by placing an "X" in the appropriate blanks.

______a. Computers are used extensively in agriculture

______b. Creates greater efficiency thus allowing better use of time

______c. Can perform jobs that otherwise would be difficult or too tedious for the average person

3. Match the major types of computers on the right with their characteristics.

______a. Typewriter-like keyboard is usually primary means of input but can be supported by other input systems; printer and/or monitor serve as primary output device; usually priced from $10,000.00 to $250,000.00

______b. Hand held and portable; has prewired functions; some models can accept stored programs; many will support small printers for output

______c. Most have monitor as primary output device; typewriter-like keyboard is primary means of input; most have auxiliary storage device which utilizes a cassette tape cartridge or magnetic floppy diskette

1. Mainframe
2. Microcomputer
3. Electronic calculator
4. Minicomputer

TEST

_____d. Magnetic tapes, disks, and monitors are primary means of input but can be supported by other input devices; can support large data bases; usually supported by smaller computers that handle input, storage, and output

4. List five general uses of the microcomputer.

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

5. Select common uses of the microcomputer in agricultural occupations by placing an "X" in the appropriate blanks.

_____a. Tax management

_____b. Chemical application

_____c. Financial records

_____d. Research

_____e. Computerized livestock feeding programs

_____f. Production records

_____g. Ag engineering applications

6. List five sources of microcomputer information.

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

# TEST

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

7. Compile a list of resources dealing with microcomputers.
8. Identify areas in agriculture where the computer is used.
9. Compile a list of computerized equipment being used in agriculture.

## ORIENTATION
## UNIT I

## ANSWERS TO TEST

1.

| | | | | | |
|---|---|---|---|---|---|
| a. | 5 | g. | 3 | m. | 11 |
| b. | 7 | h. | 1 | n. | 15 |
| c. | 6 | i. | 12 | o. | 4 |
| d. | 2 | j. | 8 | | |
| e. | 10 | k. | 13 | | |
| f. | 14 | l. | 9 | | |

2. All are correct

3. a. 4
   b. 3
   c. 2
   d. 1

4. a. Accounting
   b. Data processing
   c. Word processing
   d. Calculating formulas and equations
   e. Mechanical control devices

5. All are correct

6. Any five of the following:

   a. Microcomputer dealers
   b. Software companies
   c. Hardware manufacturers
   d. Vocational agriculture instructors
   e. Agricultural magazines/newsletters
   f. Computer magazines
   g. Local extension/university personnel
   h. People and businesses that use a microcomputer

7. — 9. Evaluated to the satisfaction of the instructor

# OPERATING PROCEDURES FOR THE MICROCOMPUTER

## UNIT OBJECTIVE

After completion of this unit, the student should be able to identify major components of the microcomputer and match the components with their functions. The student should also be able to load and run programs using system commands and load and run application programs related to agriculture. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment and job sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Match terms related to operating procedures for the microcomputer with their correct definitions.
2. Identify major components of the microcomputer.
3. Match major components of the microcomputer with their functions.
4. Match processing system components with their characteristics.
5. Match parts of the Apple IIe keyboard with their functions.
6. Match Apple introductory system commands with their functions.
7. Match parts of the Radio Shack keyboard with their functions.
8. Match Radio Shack introductory system commands with their functions.
9. Circle the words which best complete statements concerning care and maintenance of the microcomputer.
10. Complete a list of statements concerning care and maintenance of floppy diskettes.
11. Select true statements concerning factors to consider before duplicating copyrighted software programs.
12. Select true statements concerning system compatibilities.

## OBJECTIVE SHEET

13. Demonstrate the ability to:

    a. Load and run a program using introductory system commands.

    b. Load and run a program using functional system commands.

    c. Load and run a program using fundamental system commands.

    d. Load and run a program using loop system commands.

    e. Load and run a program using data system commands.

    f. Load and run an application program (average daily gain).

    g. Load and run an application program (vehicle cost).

    h. Load and run an application program (checkbook balancer).

# OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II

## SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information and assignment sheets.

III. Discuss unit and specific objectives. Eliminate those objectives dealing with specific brands which may not pertain to your classroom. Write objectives to fit your microcomputer if none are provided.

(NOTE: Information and application programs included in this unit have been developed for the Apple II compatible models or the Radio Shack Models III or IV.)

IV. Discuss information and assignment sheets.

V. Demonstrate and discuss procedures outlined in the job sheets.

(NOTE: Job Sheets #2 through #5 are optional and deal with other system commands which have been defined in the introductory information provided for instructors at the front of this manual.)

VI. Provide appropriate owner's manual for students to use when studying parts of the computer, system commands, and loading and running programs.

(NOTE: It is suggested that the actual computer be used in teaching parts of the computer to class.)

VII. Demonstrate proper operating procedures to class such as turning the microcomputer on and off.

(NOTE: Identify which disk drive is 0 and which is 1 for class. It may be helpful to mark disk drives on computers which will be used by students.)

VIII. Provide students with a list of software available for use at your school.

IX. Use advanced students as group leaders to work with students in running programs.

X. Have students put SOEP records on a record keeping program or spread sheet program.

XI. Have students run other software programs which are available.

(NOTE: See resource list which is included in introductory material.)

XII. Discuss care and maintenance of the microcomputer system in your class. Refer to the owner's manual for specific information.

XIII. Give test.

(NOTE: Instructor may desire to give test in parts over a period of time, possibly one week, to allow students to better understand information.)

## INSTRUCTIONAL MATERIALS

XIV. Reteach if necessary.

XV. Provide additional practice time if needed.

I. Included in this unit:

- A. Objective sheet
- B. Information sheet
- C. Transparency masters
    1. TM 1 — Major Components of the Microcomputer
    2. TM 2 — Flow of Computer Information
    3. TM 3 — Apple IIe Keyboard
    4. TM 4 — Radio Shack TRS-80 Model III Keyboard
    5. TM 5 — Handling a Floppy Diskette
    6. TM 6 — Inserting a Floppy Diskette
- D. Assignment Sheet #1 — Identify Major Components of the Microcomputer
- E. Job sheets
    1. Job Sheet #1 — Load and Run a Program Using Introductory System Commands
    2. Job Sheet #2 — Load and Run a Program Using Functional System Commands
    3. Job Sheet #3 — Load and Run a Program Using Fundamental System Commands
    4. Job Sheet #4 — Load and Run a Program Using Loop System Commands
    5. Job Sheet #5 — Load and Run a Program Using Data System Commands
    6. Job Sheet #6 — Load and Run an Application Program (Average Daily Gain)
    7. Job Sheet #7 — Load and Run an Application Program (Vehicle Cost)
    8. Job Sheet #8 — Load and Run an Application Program (Checkbook Balancer)

# INSTRUCTIONAL MATERIALS

F. Test

G. Answers to test

II. References:

A. Tocci, Ronald J. and Lester P. Laskowski. *Microprocessors and Microcomputers*. Second Edition. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1982.

B. Boyce, Jefferson C. *Microprocessor and Microcomputer Basics*. Englewood Cliffs, NJ: Prentice-Hall, Inc., 1979.

C. Poole, Lon, Martin McNiff, and Steven Cook. *Apple II User's Guide*. Berkeley, CA: OSBORN/McGraw-Hill, 1981.

D. *TRS-80 Model III Disk System Owner's Manual*. Fort Worth, TX: Tandy Corp., 1980.

III. Additional materials:

A. Sonka, Steven T. *Computers in Farming*. New York: McGraw-Hill Book Co., 1983.

B. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture*. Reston, VA: Reston Publishing Co., Inc., 1984.

C. Beasley, Jack O. *Microcomputers on the Farm*. Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

D. Jennings, Carol Ann. *Basic Programming*. Stillwater, OK: Mid-America Vocational Curriculum Consortium, 1982.

E. Agri-Education, Inc., 815 Shakespeare, Stratford, IA 50249.

(NOTE: Agri-Education, Inc., is a software distributor of agricultural computer programs designed for educational purposes. Write for a catalog of current offerings.)

F. Microcomputer Programs in Agriculture. Vocational Agriculture Service, University of Illinois, 1401 S. Maryland Drive, Urbana, IL 61801.

(NOTE: A series of 16 microcomputer programs are available for the Apple II Plus, TRS-80 Model III, and Commodore Pet machines. Write to the above address for more information.)

G. Career Aids, Inc., 8950 Lurline Avenue, Dept. TE, Chatsworth, CA 91311.

(NOTE: A catalog entitled, *Multimedia Materials for Occupational, Vocational, and Career Education*, may be obtained by writing to the above address. This catalog provides a complete listing of supplementary materials which may be used in teaching microcomputer use.)

Example: "Computer Education", a color filmstrip with cassette outlining step-by-step procedures in operating a Radio Shack or Apple computer

# OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II

## INFORMATION SHEET

I. Terms and definitions

A. Arithmetic/logic unit — Major component of the central processing unit which performs all arithmetic and logical operations under the direction of the control unit

B. Auxiliary storage device — Supplementary means for storing data

(NOTE: This is also referred to as mass storage.)

C. Backup — To duplicate a file or separate piece of media in case the original is lost

D. BASIC — Beginner's All-purpose Symbolic Instruction Code; Programming language developed at Dartmouth College for use in academic computing, but widely used on microcomputers

E. Bit — Smallest unit of information that can be recognized by a computer

F. Byte — The unit of measure of a computer's memory; normally holds one character (usually 8 bits)

G. K — Symbol denoting 1,024 units (bytes) of information

H. Boot the disk — Process of adding the DOS commands to the BASIC in Apple II

I. Central processing unit (CPU) — Major component of a computer system responsible for processing all data handled by the system; consists of the control and arithmetic/logic unit

J. Character — Single decimal value, letter of the alphabet, or space

K. Chips — Miniature integrated circuits which have replaced transistors

(NOTE: Integrated circuits are complete electronic circuits which are assembled in a single process.)

L. Controller card — Small circuit board used to provide numerous functions depending on its purpose

(NOTE: This is also called an interface card.)

M. Cursor — Character which indicates position on screen; is usually represented by a blinking square or underline

## INFORMATION SHEET

N. Disk operating system (DOS) — Program responsible for the housekeeping and communications between the disk storage device and the computer

(NOTE: The most popular systems are DOS and CP/M.)

O. Documentation — Illustrations and explanations that include both general information needed by the user of the program and the specific information needed by the computer operator or the computer programmer if the program later needs updating

P. Emulation — Technique using software or microprogramming in which one computer is made to behave exactly like another computer

Q. Hard copy — Printed output from an information system

R. HELLO — Name for the greeting program

S. Interface — Controller for input/output which can be parallel (8 bits at a time) or serial (1 bit at a time)

T. Memory — Storage area of the computer which holds programs and data being processed

(NOTE: Size of memory is defined by the number of K.)

U. Menu — List of choices or alternatives for user action; often a list of program options

V. Modem — Device that converts data into impulses and transmits them over telephone lines from the terminal to the computer and vice versa

W. Peripheral device — Device connected to a computer to provide communication (input/output) or auxiliary functions

Examples: Modem, printer, voice modules, disk drive

X. Printer — Computer output device that produces printed copy

Y. Program — Complete set of instructions that directs the computer and coordinates the operation of the various computer components

Z. Programming languages — Languages used in writing programs to direct processing steps carried out by a computer

## INFORMATION SHEET

AA. Random Access Memory (RAM) — Main storage areas used with microcomputers, minicomputers, and text-editing equipment into which data can be written or read

(NOTE: Memory is erased when power is turned off.)

BB. Read Only Memory (ROM) — Storage areas used with microcomputers, minicomputers, and text-editing equipment that permit data to be read from them because they are permanently wired to perform one function or contain specific data

CC. Syntax — Rules governing sentence structure in a language or statement structure in a language such as that of a compiler program

(NOTE: Syntax errors may occur due to incorrect spelling or incorrect use of commands.)

DD. System commands — Commands used in running the disk operating system (DOS)

EE. Word processing system — The combination of specific procedures, methods, equipment, and people designed to accomplish the transition of a written, verbal, or recorded word distributed to its ultimate use

II. Major components of the microcomputer (Assignment Sheet #1; Transparency 1)

A. Keyboard

B. Processor

C. Monitor

D. Disk drive

E. Printer

III. Major components of the microcomputer and their functions (Transparency 2)

(NOTE: Transparency 2 represents the flow of computer information through the system.)

A. Keyboard — Used to input data into the system

B. Processor — Processes data which is fed into system

C. Monitor — Displays output

D. Disk drive — Reads and/or writes data on floppy diskette

E. Printer — Outputs data onto paper

## INFORMATION SHEET

IV. Processing system components and their characteristics

- A. Central processing unit (CPU)
  - 1. Made of multiple integrated circuits
  - 2. Performs all operations on the data
    - a. Arithmetic — Addition, subtraction, multiplication, division, exponentiation
    - b. Logic — Greater than, less than, equal to, not equal to
  - 3. Controls the functions of all other parts of the computer

    (NOTE: In the future, the CPU will include all RAM or ROM memory.)
- B. Random Access Memory (RAM)
  - 1. Made of multiple integrated circuits
  - 2. RAM memory is accessed by the CPU
  - 3. Data entered into the computer, either by the keyboard or floppy diskette, is stored in RAM
  - 4. Will lose all stored data when electrical power is shut off
- C. Read Only Memory (ROM)
  - 1. Made of multiple integrated circuits
  - 2. Used to store data that does not change

    Example: Operating information
  - 3. Data entered into the computer by manufacturer
  - 4. Will retain data at all times
- D. Controller cards
  - 1. Made of small circuit boards
  - 2. Inserted into slots in side of computer
  - 3. Serve numerous jobs such as interfacing printers and disk drives and providing different programming languages

INFORMATION SHEET

E. Power transformer

1. Changes current of 110-120 volts to a voltage that the computer can handle

2. Computer uses small amounts of amperage and can be left on for long periods of time without damage

(NOTE: Print left on the monitor for long periods of time can damage the monitor.)

V. Parts of the Apple IIe keyboard and their functions (Transparency 3)

A. Shift keys — Found on the lower left and lower right side of the keyboard; allows the use of the upper symbols on keys with two symbols and the upper case letter on computers that have lower and upper case letters

B. Return key — Enters response for interpretation

C. Ctrl (control) key — Causes certain other keys to have and perform third functions by holding the control key down while pressing and releasing the other key

D. Reset — Used only to correct problems which have caused machine to "hang up" or suspend operation

E. Rept (repeat) key — Allows continuous repetition of a second key

(NOTE: Many computers have a repeat function built in by depressing and holding the key down.)

F. Esc (escape) key — Used in duo with other keys on screen editing functions

G. Arrow keys — Move the cursor in the direction of the arrows

H. Letter keys — Represent letters marked on each key plus a standard set of symbols

I. Number keys — Numbers Ø thru 9

(NOTE: On some keyboards the 0 is indicated by a slash [Ø]. The number Ø cannot be substituted by the letter O or the number 1 by the letter L.)

VI. Apple introductory system commands and their functions

A. CATALOG — Displays a list of all the programs that are available on a diskette on the screen

## INFORMATION SHEET

B. RUN — Causes loading and execution of the program currently in memory or the program named

C. HELLO — Name of the identification program on the disk

VII. Parts of the Radio Shack keyboard and their functions (Transparency 4)

A. Left arrow (←) — Backspaces and erases the last character typed

B. Right arrow (→) — Tabs over to the next eight-column boundary

C. Shift, left arrow — Starts over at the beginning of the line

D. Shift, right arrow — Converts to 32 characters/line

E. Shift, @ — Pauses program execution; press any key to continue

F. Clear key — Cancels the current line, erases the display, converts to 64 characters/line, and positions the cursor to the upper left corner ("HOME")

G. Enter key — Enters the line; BASIC will not interpret a line until ENTER is pressed

H. Break key — Interrupts the current program or operation and prepares the computer for another keyboard command; used to cancel a cassette or line printer operation, or to break out of a BASIC program

I. Shift, down arrow,* — Activates the printer screen function, copies the contents of the screen to the printer; press BREAK to terminate this function and return to the immediate mode

J. Letter keys — Represents letters marked on each key plus a standard set of symbols

K. Number keys — Numbers 0 thru 9

(NOTE: The number 0 cannot be substituted by the letter O or the number 1 by the letter L.)

VIII. Radio Shack introductory system commands and their functions

A. DIR (directory) — Lists files available on a diskette

B. RUN — Causes loading and execution of the program currently in memory or the program named

C. TRSDOS — Prepares computer to accept program, to call up information needed, or to type in new program for use

## INFORMATION SHEET

IX. Care and maintenance of the microcomputer

- A. Provide a safe, adequate storage space with a temperature range from 50°F to 110°F
- B. Protect from direct sunlight, moisture, or dust
- C. Use a static mat to control static electricity

  (NOTE: Static electricity will stop program execution.)
- D. Never pull diskette out of disk drive when red light is on
- E. Provide protection from electrical surge

  (NOTE: A voltage regulator may be used to protect the microcomputer in case of electrical surge.)
- F. Consult owner's manual for proper care and maintenance procedures pertaining to a specific model

X. Care and maintenance of floppy diskettes (Transparencies 5 and 6)

- A. Never bend or fold diskette
- B. Keep away from magnetic fields such as transformers, magnets, television sets, and radios

  (NOTE: Magnetic fields will erase or alter diskettes.)
- C. Do not place diskette on top of monitor or disk drive(s)
- D. Never expose to x-ray equipment
- E. Store between 50°F to 110°F
- F. Store in protective jackets in a vertical position
- G. Never touch the surface of the diskette

  (NOTE: Skin oils will damage the disk.)
- H. Always insert the diskette carefully into the disk drive
- I. Use only a felt tip pen to write on label of diskette jacket
- J. Make "back up" copies of all program software and store originals in a safe place

## INFORMATION SHEET

XI. Factors to consider before duplicating copyrighted software programs

A. Many commercial programs take years of research and development as well as large amounts of capital to produce

B. When commercial software is purchased, only the right to use the software is obtained

C. An individual is permitted to make additional copies **only** for backup or archival purposes

D. Giving copies of commercial software to friends is illegal and discourages the development of new software

XII. System compatibilities

A. Microcomputer manufacturers have their own version of BASIC or other programming languages which will not work in other systems

B. Most monitors and television sets will connect to any microcomputer; however, television sets may need an additional piece of equipment to complete the connection

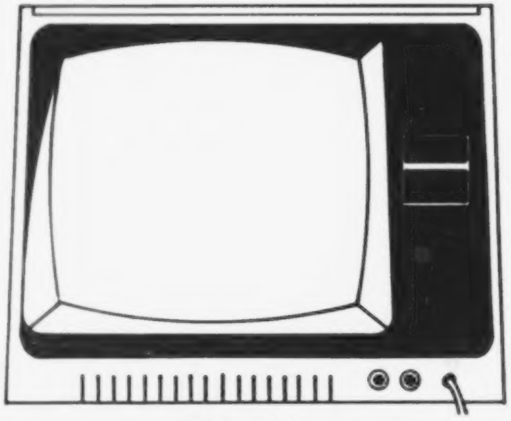
C. The printer must be compatible with the microcomputer

(NOTE: Before purchasing a printer, consult your dealer to make sure the printer will connect to the computer.)

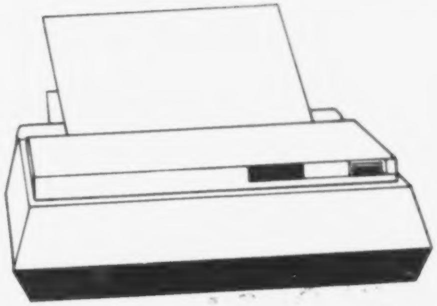
D. Blank diskettes are usable in most disk drives as long as they are the same size

(NOTE: The most common disk size is 5 1/4 inches in diameter.)

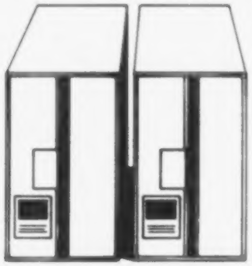
# Major Components of the Microcomputer



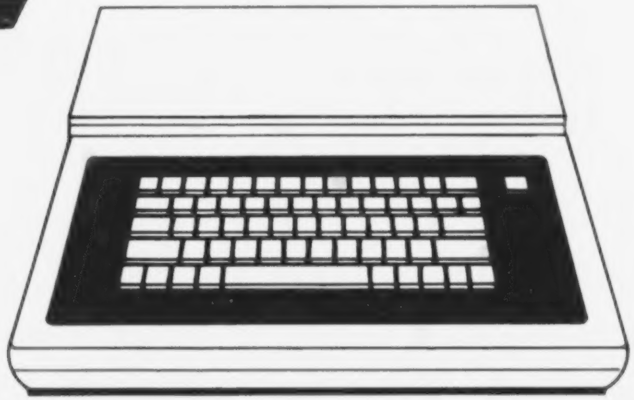
Monitor



Printer

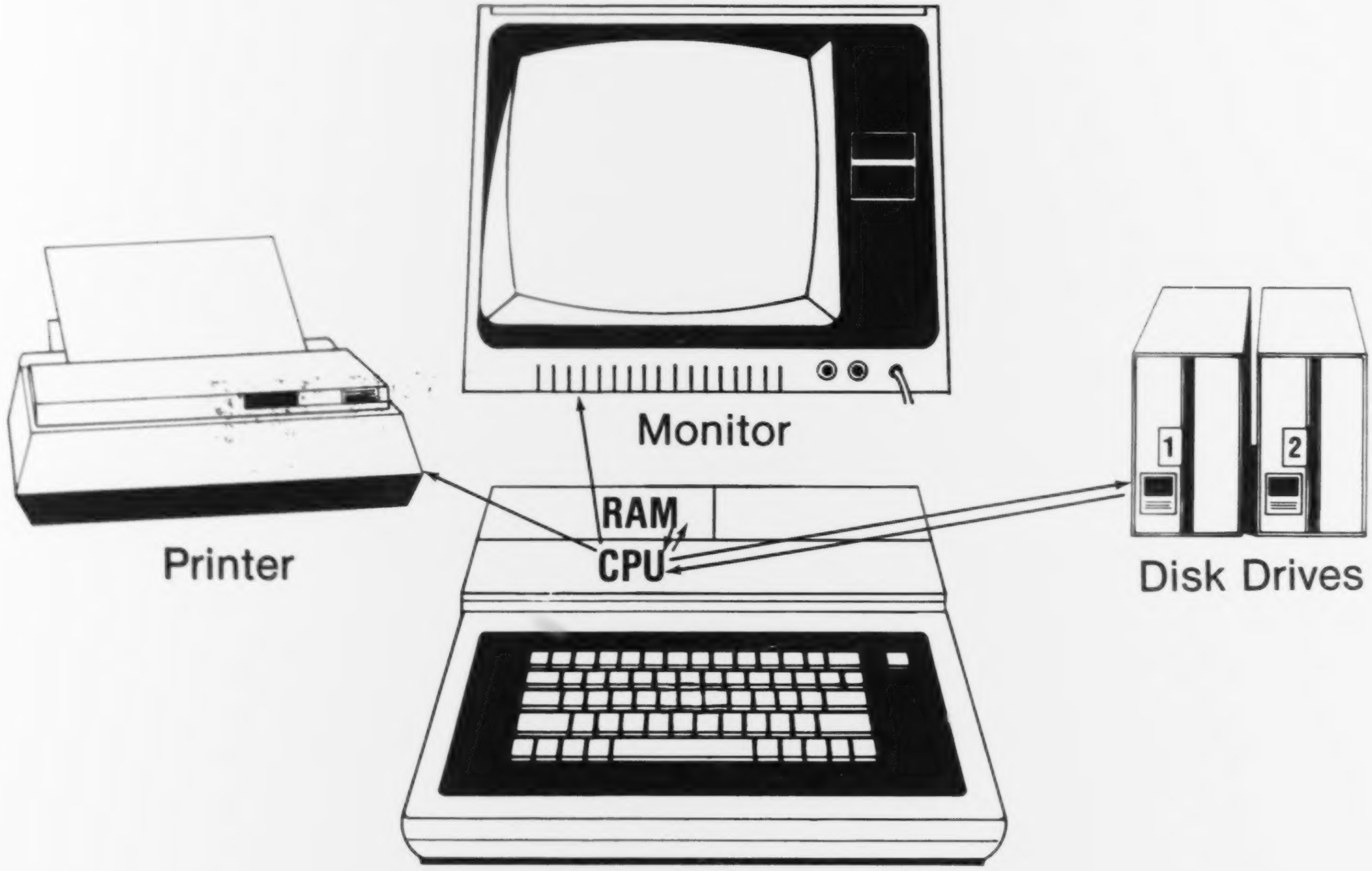


Disk Drives



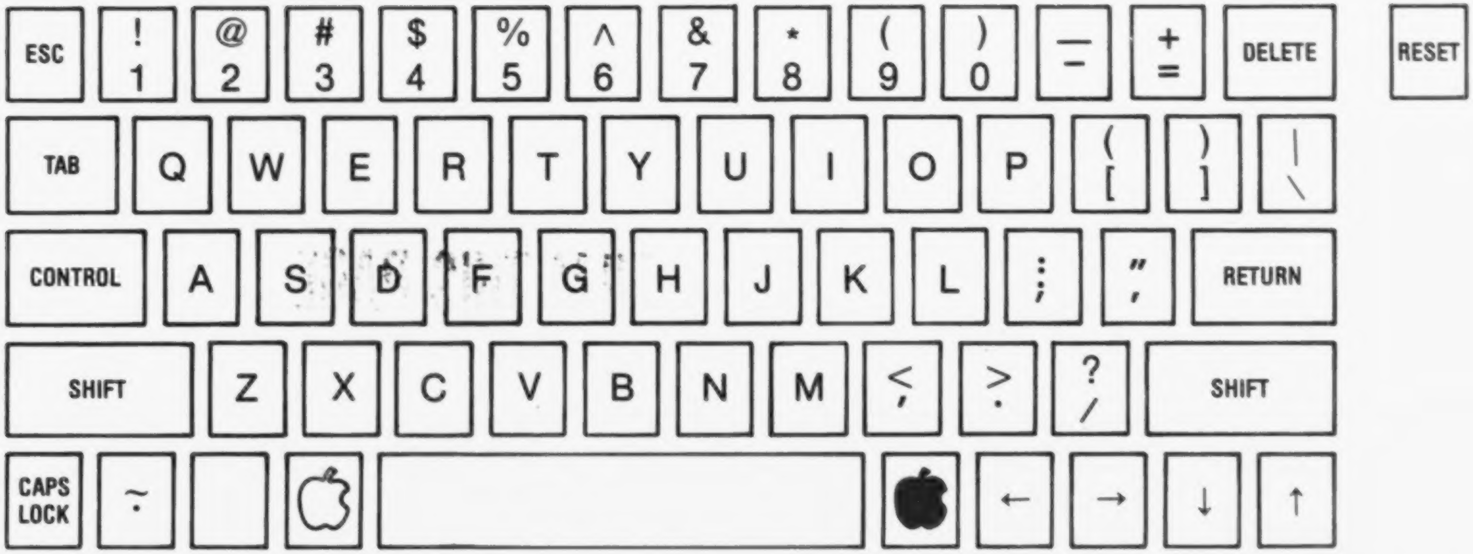
Microcomputer with Keyboard

# Flow of Computer Information


Monitor
Printer
RAM
CPU
1
2
Disk Drives

Microcomputer with Keyboard

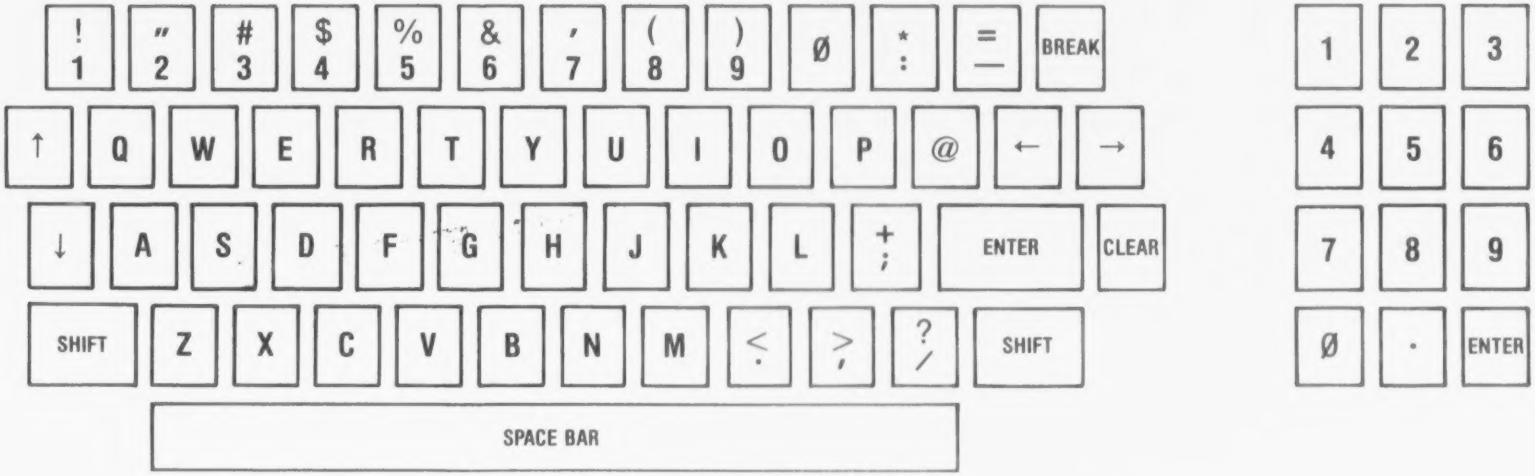
# Apple IIe Keyboard


ESC
!
1
@
2
#
3
$
4
%
5
^
6
&
7
*
8
(
9
)
0
—
–
+
=
DELETE
RESET
TAB
Q
W
E
R
T
Y
U
I
O
P
{
[
}
]
|
\
CONTROL
A
S
D
F
G
H
J
K
L
:
;
"
'
RETURN
SHIFT
Z
X
C
V
B
N
M
<
,
>
.
?
/
SHIFT
CAPS LOCK
~
`
←
→
↓
↑

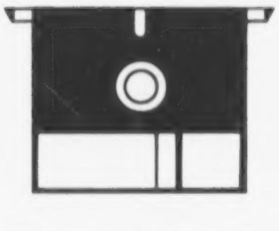
TM 3

MAA - 47

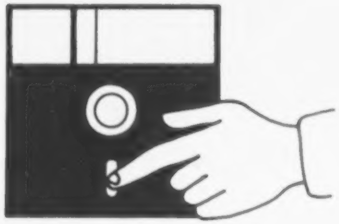
# Radio Shack TRS-80 Model III Keyboard


! 1
" 2
# 3
$ 4
% 5
& 6
' 7
( 8
) 9
0
* :
= —
BREAK
↑
Q
W
E
R
T
Y
U
I
O
P
@
←
→
↓
A
S
D
F
G
H
J
K
L
+ ;
ENTER
CLEAR
SHIFT
Z
X
C
V
B
N
M
< .
> ,
? /
SHIFT
SPACE BAR
1
2
3
4
5
6
7
8
9
0
.
ENTER

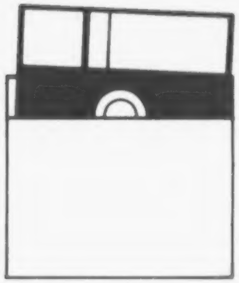
# Handling a Floppy Diskette



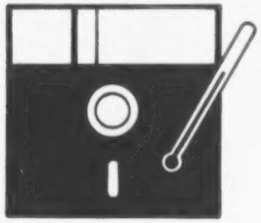
Insert carefully



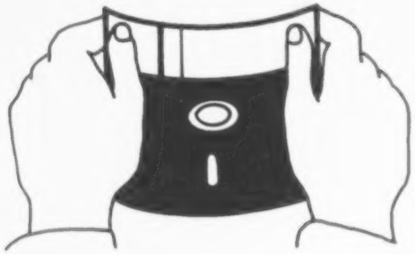
Never touch diskette



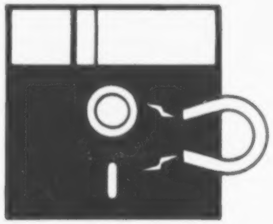
Protect in envelope



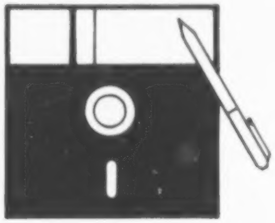
Maintain temperature of 50°F to 125°F



Do not bend or fold

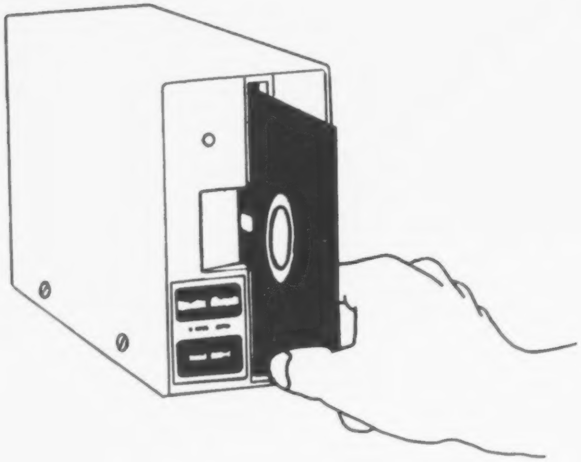


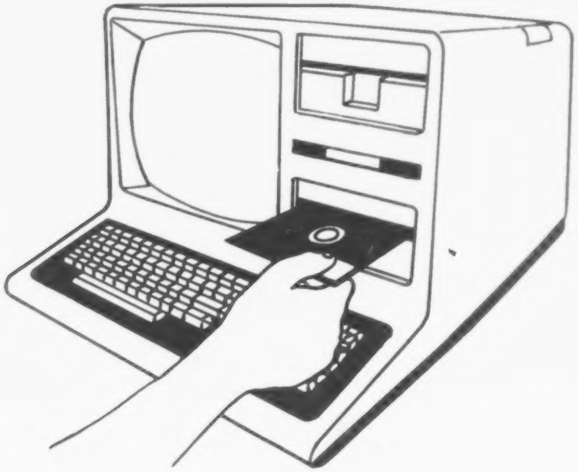
Never expose to magnetic field

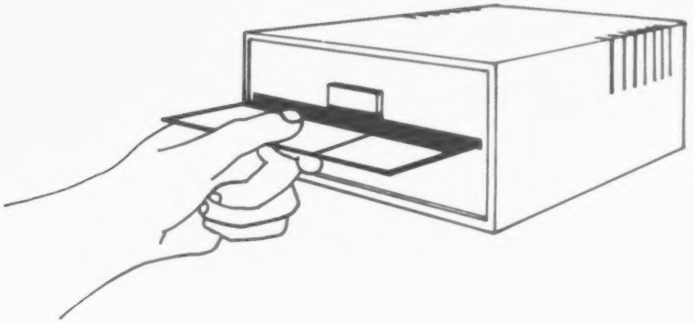


Use only felt tip pen on jacket

# Inserting a Floppy Diskette



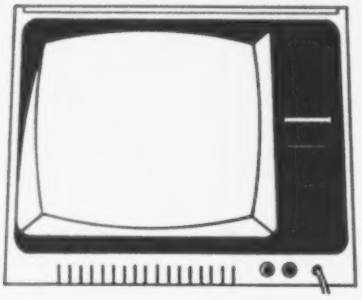




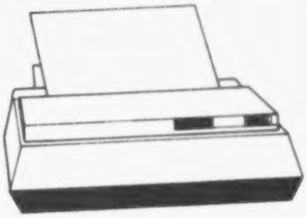
# OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II

## ASSIGNMENT SHEET #1 — IDENTIFY MAJOR COMPONENTS OF THE MICROCOMPUTER

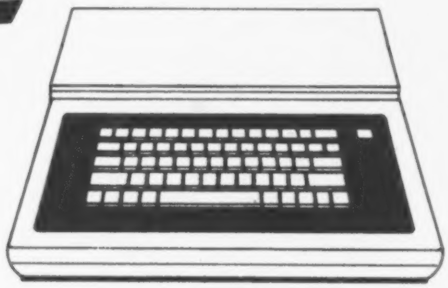
Directions: Identify major components of the microcomputer by placing the correct name in each blank.



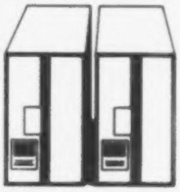
a.



b.



c.

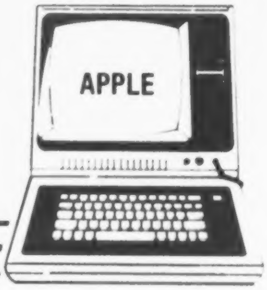


d.

a. ______________________ c. ______________________

b. ______________________ d. ______________________

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II



## JOB SHEET #1 — LOAD AND RUN A PROGRAM USING INTRODUCTORY SYSTEM COMMANDS

I. Equipment and materials needed

- A. Microcomputer

  (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

- B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

- A. Insert the diskette in Disk Drive 1

  (NOTE: Hold the diskette with the square notch to the left and the label facing up.)

- B. Close the disk drive door
- C. Turn on the computer

  (NOTE: The diskette will self boot. If not, type [PR#6]. This will put the menu on the screen.)

- D. Type the number [2] designating a program entitled "Commands" and press [RETURN]
- E. Read the description of the program and press [RETURN]
- F. Continue reading the description of the program and press [RETURN] at the end of each screen

## JOB SHEET #1

G. From the list of categories of commands, type [1] and press [RETURN] (Figure 1)

(NOTE: This will begin the program which discusses the **introductory system commands** used in writing and using programs with a microcomputer. There are three introductory system commands.)

FIGURE 1

```
1.     INTRODUCTORY COMMANDS
2.     FUNCTIONAL COMMANDS
3.     FUNDAMENTAL COMMANDS
4.     LOOP COMMANDS
5.     DATA COMMANDS
6.     NONE

WHICH WOULD YOU LIKE TO REVIEW NOW?
  (ENTER 1, 2, 3, 4, 5, or 6)
```

H. Follow the commands through the remainder of the program and BE SURE to press [RETURN] after completing the commands directed by the program

I. After completing the program, you will be returned to a listing of the five categories of commands (Figure 1)

J. If additional practice is needed, repeat Steps G through I

K. Type [6] and press [RETURN] when you have completed the above steps

L. After viewing the concluding "Good Luck" graphics, turn off the computer

M. Open the disk drive door and remove the diskette

N. Replace the diskette in its protective jacket and file for later use

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II

RADIO
SHACK

## JOB SHEET #1 — LOAD AND RUN A PROGRAM USING INTRODUCTORY SYSTEM COMMANDS

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "COMMANDS"] and press [ENTER]

K. After seeing the title, *Microcomputer Applications in Agriculture,* press [ENTER]

L. Read information as screened and follow [ENTER] commands as directed

M. Read screen which lists six types of commands (Figure 1)

FIGURE 1

```
1.     INTRODUCTORY COMMANDS
2.     FUNCTIONAL COMMANDS
3.     FUNDAMENTAL COMMANDS
4.     LOOP COMMANDS
5.     DATA COMMANDS
6.     NONE

WHICH WOULD YOU LIKE TO REVIEW NOW?
       (ENTER 1, 2, 3, 4, 5, or 6)
```

N. From the list of categories of commands, type [1] and [ENTER] (Figure 1)

(NOTE: This will begin the program which discusses the introductory system commands used in writing and using programs with a microcomputer. There are three introductory system commands.)

O. Follow the commands through the remainder of the program and BE SURE to press [ENTER] after completing the commands directed by the program

P. After completing the program, you will be returned to the original menu (Figure 1)

Q. If additional practice is needed, repeat Steps K through P

R. Press [6] and [ENTER] when you have completed the above steps

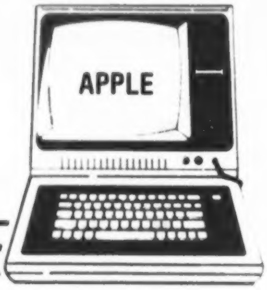
JOB SHEET #1

S. After viewing the concluding "Good Luck" graphics, open the disk drive door and remove the diskette

T. Replace the diskette in its protective jacket and file for later use

U. Turn the computer off

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II



## JOB SHEET #2 — LOAD AND RUN A PROGRAM USING FUNCTIONAL SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming any of the APPLE II compatible models of microcomputers.)

I. Equipment and materials needed

   A. Microcomputer

      (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

   B. Accompanying software

      (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Complete steps A through F in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

      (NOTE: Remember to type in all commands as directed and then press the [RETURN] key to complete the command.)

   B. From the list of categories of commands, type [2] and press [RETURN]

      (NOTE: This will begin the **Functional System Commands** portion of the program. There are four functional commands.)

   C. Follow the commands through the remainder of the program

   D. After completing the program, you will be returned to a listing of the five categories of commands

   E. If additional practice is needed, repeat the above steps

   F. Type [6] and press [RETURN] when you have completed the above steps

## JOB SHEET #2

G. After viewing the concluding "Good Luck" graphics, turn off the computer

H. Open the disk drive door and remove the diskette

I. Replace the diskette in its protective jacket and file for later use

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II

RADIO
SHACK

## JOB SHEET #2 — LOAD AND RUN A PROGRAM USING FUNCTIONAL SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming a Radio Shack, Model III or Model IV microcomputer.)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or Model IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Complete steps A through M in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

(NOTE: Remember to type in all commands as directed, then press the [ENTER] key to complete the program.)

B. From the list of categories of commands, type [2] and [ENTER]

(NOTE:This will begin the **Functional System Commands** portion of the program. There are four functional commands.)

C. Follow the commands through the remainder of the program

D. After completing the program, you will be returned to the original menu

E. If additional practice is needed, repeat the above steps

F. Press [6] and [ENTER] when you have completed the steps

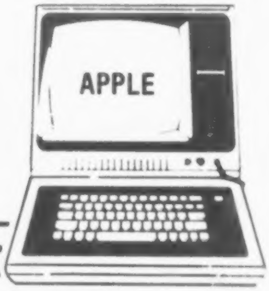
## JOB SHEET #2

G. After viewing the concluding "Good Luck" graphics, open the disk drive door and remove the diskette

H. Replace the diskette in its protective jacket and file for later use

I. Turn the computer off

# OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II



### JOB SHEET #3 — LOAD AND RUN A PROGRAM USING FUNDAMENTAL SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming any of the APPLE II compatible models of microcomputers.)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Complete steps A through F in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

(NOTE: Remember to type in all commands as directed and then press the [RETURN] key to complete the command.)

B. From the list of categories of commands, type [3] and press [RETURN]

(NOTE: This will begin the **Fundamental System Commands** portion of the program. There are six fundamental commands.)

C. Follow the commands through the remainder of the program

D. After completing the program, you will be returned to a listing of the five categories of commands

E. If additional practice is needed, repeat the above steps

F. Type [6] and press [RETURN] when you have completed the above steps

## JOB SHEET #3

G. After viewing the concluding "Good Luck" graphics, turn off the computer

H. Open the disk drive door and remove the diskette

I. Replace the diskette in its protective jacket and file for later use

# OPERATING PROCEDURES FOR THE MICROCOMPUTER
# UNIT II

RADIO
SHACK

## JOB SHEET #3 — LOAD AND RUN A PROGRAM USING FUNDAMENTAL SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming either a Radio Shack, Model III or Model IV microcomputer.)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or Model IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Complete steps A through M in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

(NOTE: Remember to type in all commands as directed, then press the [ENTER] key to complete the program.)

B. From the list of categories of commands, type [3] and [ENTER]

(NOTE:This will begin the **Fundamental System Commands** portion of the program. There are six fundamental commands.)

C. Follow the commands through the remainder of the program

D. After completing the program, you will be returned to the original menu

E. If additional practice is needed, repeat the above steps

F. Press [6] and [ENTER] when you have completed the steps

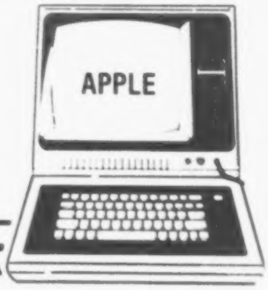
## JOB SHEET #3

G. After viewing the concluding "Good Luck" graphics, open the disk drive door and remove the diskette

H. Replace the diskette in its protective jacket and file for later use

I. Turn the computer off

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II



## JOB SHEET #4 — LOAD AND RUN A PROGRAM USING LOOP SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming any of the APPLE II compatible models of microcomputers.)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Complete steps A through F in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

  (NOTE: Remember to type in all commands as directed and then press the [RETURN] key to complete the command.)

  B. From the list of categories of commands, type [4] and press [RETURN]

  (NOTE: This will begin the **Loop System Commands** portion of the program. There are five loop commands.)

  C. Follow the commands through the remainder of the program

  D. After completing the programs, you will be returned to a listing of the five categories of commands

  E. If additional practice is needed, repeat the above steps

  F. Type [6] and press [RETURN] when you have completed the above steps

## JOB SHEET #4

G. After viewing the concluding "Good Luck" graphics, turn off the computer

H. Open the disk drive door and remove the diskette

I. Replace the diskette in its protective jacket and file for later use

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II

RADIO
SHACK

## JOB SHEET #4 — LOAD AND RUN A PROGRAM USING LOOP SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming either a Radio Shack, Model III or Model IV microcomputer.)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or Model IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Complete steps A through M in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

(NOTE: Remember to type in all commands as directed, then press the [ENTER] key to complete the program.)

B. From the list of categories of commands, type [4] and [ENTER]

(NOTE:This will begin the **Loop System Commands** portion of the program. There are five loop commands.)

C. Follow the commands through the remainder of the program

D. After completing the program, you will be returned to the original menu

E. If additional practice is needed, repeat the above steps

F. Press [6] and [ENTER] when you have completed the steps

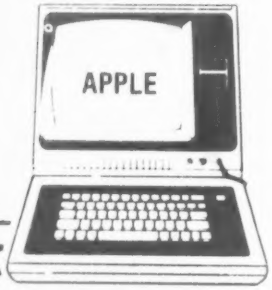
## JOB SHEET #4

G. After viewing the concluding "Good Luck" graphics, open the disk drive door and remove the diskette

H. Replace the diskette in its protective jacket and file for later use

I. Turn the computer off

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II



## JOB SHEET #5 — LOAD AND RUN A PROGRAM USING DATA SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming any of the APPLE II compatible models of microcomputers.)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Complete steps A through F in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

  (NOTE: Remember to type in all commands as directed and then press the [RETURN] key to complete the command.)

  B. From the list of categories of commands, type [5] and press [RETURN]

  (NOTE: This will begin the **Data System Commands** portion of the program. There are four data commands.)

  C. Follow the commands through the remainder of the program

  D. After completing the program, you will be returned to a listing of the five categories of commands

  E. If additional practice is needed, repeat the above steps

  F. Type [6] and press [RETURN] when you have completed the above steps

## JOB SHEET #5

G. After viewing the concluding "Good Luck" graphics, turn off the computer

H. Open the disk drive door and remove the diskette

I. Replace the diskette in its protective jacket and file for later use

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II

RADIO
SHACK

## JOB SHEET #5 — LOAD AND RUN A PROGRAM USING DATA SYSTEM COMMANDS

(NOTE: This job sheet and the accompanying program are designed for the more advanced student who is interested in mastering the basics related to programming either a Radio Shack, Model III or Model IV microcomputer.)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or Model IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Complete steps A through M in Job Sheet #1 — Load and Run a Program Using Introductory System Commands

(NOTE: Remember to type in all commands as directed, then press the [ENTER] key to complete the program.)

B. From the list of categories of commands, type [5] and [ENTER]

(NOTE:This will begin the **Data System Commands** portion of the program. There are four data commands.)

C. Follow the commands through the remainder of the program

D. After completing the program, you will be returned to the original menu

E. If additional practice is needed, repeat the above steps

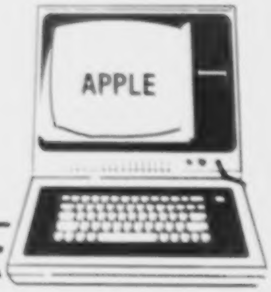
F. Press [6] and [ENTER] when you have completed the steps

## JOB SHEET #5

G. After viewing the concluding "Good Luck" graphics, open the disk drive door and remove the diskette

H. Replace the diskette in its protective jacket and file for later use

I. Turn the computer off



## JOB SHEET #6 — LOAD AND RUN AN APPLICATION PROGRAM (AVERAGE DAILY GAIN)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with any of the Apple II compatible models.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Insert the diskette in Disk Drive 1

(NOTE: Hold the diskette with the square notch to the left and the label facing up.)

B. Close the disk drive door

C. Turn on the computer

(NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

D. Type the number [3] designating "Average Daily Gain" and press [RETURN]

E. Read the description of the program and press [RETURN]

F. Continue reading the description and press [RETURN]

G. Enter the number of animals for which you wish to figure average daily gain and press [RETURN]

(NOTE: Limit the number of animals to five or less.)

## JOB SHEET #6

H. Enter first animal's identification or tag number and press [RETURN]

I. Enter final weight and press [RETURN]

J. Enter starting weight and press [RETURN]

K. Enter number of days between starting weigh-in and the final weigh-in and press [RETURN]

L. Read average daily gain for first animal presented on table and press [RETURN]

M. Repeat steps H through L for the number of animals indicated in step G

N. After information for all animals has been entered, view summary table

O. Indicate if you need to figure average daily gain for any more animals

  1. If yes, type [Y] and press [RETURN]

     (NOTE: Program will return to step G.)

  2. If no, type [N] and press [RETURN]

     (NOTE: This will end the program. If you decide to run additional calculations at this point, type [RUN] to return to the beginning of the program.)

P. Using the method of running an application program outlined above, complete the following problems

PROBLEM #1: Determine the average daily gain for the following beef steers.

| ID NUMBER | FINAL WEIGHT | STARTING WEIGHT | DAYS ON FEED | ADG |
|---|---|---|---|---|
| #12 | 830 LBS. | 440 LBS. | 177 | ________ |
| #32 | 741 LBS. | 390 LBS. | 185 | ________ |
| #44 | 810 LBS. | 413 LBS. | 176 | ________ |

PROBLEM #2: Determine the average daily gain for the following market pigs.

| ID NUMBER | FINAL WEIGHT | STARTING WEIGHT | DAYS ON FEED | ADG |
|---|---|---|---|---|
| #05 | 234 LBS. | 45 LBS. | 76 | ________ |
| #23 | 225 LBS. | 40 LBS. | 80 | ________ |
| #56 | 240 LBS. | 54 LBS. | 84 | ________ |

## JOB SHEET #6

PROBLEM #3: Using information from your own farming program or from an example given to you by your instructor, calculate the average daily gain on other livestock. Use accurate information from actual farm records for your inputs if possible

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II

RADIO
SHACK

## JOB SHEET #6 — LOAD AND RUN AN APPLICATION PROGRAM (AVERAGE DAILY GAIN)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or Model IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #6

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [3] designating "Average Daily Gain" and press [ENTER]

L. Read the description of the program and press [ENTER]

M. Continue reading the description and press [ENTER]

N. Enter the number of animals for which you wish to figure average daily gain and press [ENTER]

(NOTE: Limit the number of animals to five or less.)

O. Enter first animal's identification or tag number and press [ENTER]

P. Enter final weight and press [ENTER]

Q. Enter starting weight and press [ENTER]

R. Enter number of days between starting weigh-in and the final weigh-in and press [ENTER]

S. Read average daily gain for first animal presented on table and press [ENTER]

T. Repeat steps O through S for the number of animals indicated in step N

U. After information for all animals has been entered, view summary table

V. Indicate if you need to figure average daily gain for any more animals

1. If yes, type [Y] and press [ENTER]

   (NOTE: Program will return to step N.)

2. If no, type [N] and press [ENTER]

   (NOTE: This will end the program. If you decide to run additional calculations at this point, repeat steps K through U.)

## JOB SHEET #6

W. Using the method of running an application program outlined above, complete the following problems

PROBLEM #1: Determine the average daily gain for the following beef steers.

| ID NUMBER | FINAL WEIGHT | STARTING WEIGHT | DAYS ON FEED | ADG |
|---|---|---|---|---|
| #12 | 830 LBS. | 440 LBS. | 177 | ________ |
| #32 | 741 LBS. | 390 LBS. | 185 | ________ |
| #44 | 810 LBS. | 413 LBS. | 176 | ________ |

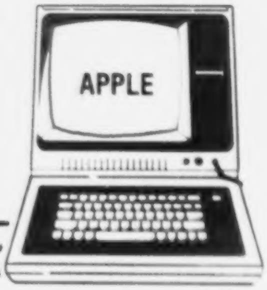
PROBLEM #2: Determine the average daily gain for the following market pigs.

| ID NUMBER | FINAL WEIGHT | STARTING WEIGHT | DAYS ON FEED | ADG |
|---|---|---|---|---|
| #05 | 234 LBS. | 45 LBS. | 76 | ________ |
| #23 | 225 LBS. | 40 LBS. | 80 | ________ |
| #56 | 240 LBS. | 54 LBS. | 84 | ________ |

PROBLEM #3: Using information from your own farming program or from an example given to you by your instructor, calculate the average daily gain on other livestock. Use accurate information from actual farm records for your inputs if possible

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II



## JOB SHEET #7 — LOAD AND RUN AN APPLICATION PROGRAM (VEHICLE COST)

I. Equipment and materials needed

   A. Microcomputer

   (NOTE: This job sheet has been designed to be used with any of the Apple II compatible models.)

   B. Accompanying software

   (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Insert the diskette in Disk Drive 1

   (NOTE: Hold the diskette with the square notch to the left and the label facing up.)

   B. Close the disk drive door

   C. Turn on the computer

   (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

   D. Type the number [4] designating "Vehicle Cost Analysis" and press [RETURN]

   E. Read the description of the program and press [RETURN]

   F. Continue reading the description and press [RETURN]

   G. After viewing input table, type [Y] if you would like to change any input

   (NOTE: Do not press [RETURN].)

## JOB SHEET #7

H. Enter number of the item you wish to change and press [RETURN]

I. Enter the new value and press [RETURN]

J. Repeat steps G through I to change any needed information

K. When all inputs have been entered, type [N] for no further input

(NOTE: Do not press [RETURN] at this time.)

L. View output table

M. If you would like to work with this program more, type [Y]

N. Select the number of your choice from the alternatives presented

O. Use any appropriate alternatives to further analyze vehicle cost

P. When the final output table is displayed, type [N] to exit out of the program

(NOTE: If you decide to run additional calculations at this point, type [RUN] to return to beginning of program.)

Q. Complete the following problems using the procedures outlined above

(NOTE: If you have difficulty with the program, start the program again. This will help you to understand use of the application.)

PROBLEM #1: Determine the annual cost of owning a new vehicle and the cost of operation per mile under the following conditions.

1. The original cost of the car is $7500.00.
2. The resale price will be $3000.00.
3. The annual use will be 15,000 miles.
4. You plan to keep the car 5 years.
5. Fuel use is about 25 miles per gallon.
6. The cost of fuel is currently $1.25/gallon.
7. Interest on the value of the car is 13%.
8. License and taxes cost $75.00/year.
9. Insurance is costing you $400.00/year.
10. Tire cost is $400.00.
11. Tire life is 30,000 miles.
12. Maintenance will average about $125.00/year.

USING THESE FIGURES, CALCULATE THE FOLLOWING:

A. What is the annual cost of owning the car? ____________________

B. What is the fuel cost per mile? ____________________

C. What is the depreciation cost per mile? ____________________

D. What is the total cost per mile? ____________________

## JOB SHEET #7

PROBLEM #2: Using the same information from problem one, what is the annual cost of operating a vehicle and the total cost per mile under the following conditions?

(NOTE: You will need to go back to the input table and enter new information.)

A. The cost of insurance goes from $400.00 to $250.00 per year because of a good driver discount.

Annual cost = ______________________________
Cost per mile = ______________________________

B. You bought a used car for $4000, plan to keep it for 3 years and sell it for $2300 at the end of that time.

Annual cost = ______________________________
Cost per mile = ______________________________

C. You bought a 4-wheel drive pickup for $13,000, plan to keep it for 4 years and sell it for $5000. Annual miles will be 6,000, gasoline will cost $1.25 per gallon; mileage is 12 MPG, tire cost is $800 and tire life is 20,000 miles; maintenance is $300.

Annual cost = ______________________________
Cost per mile = ______________________________

PROBLEM #3: Using information from your own vehicle, family vehicle, or from an example given to you by your instructor, calculate the annual cost of owning the vehicle and the cost of operation per mile. You may wish to use the farm truck as an example.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# OPERATING PROCEDURES
# FOR THE MICROCOMPUTER
# UNIT II

RADIO
SHACK

## JOB SHEET #7 — LOAD AND RUN AN APPLICATION PROGRAM (VEHICLE COST)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

JOB SHEET #7

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [4] designating "Vehicle Cost Analysis" and press [ENTER]

L. Read the description of the program and press [ENTER]

M. Continue reading the description and press [ENTER]

N. After viewing input table, type [Y] if you would like to change any input and press [ENTER]

O. Enter number of the item you wish to change and press [ENTER]

P. Enter the new value and press [ENTER]

Q. Repeat steps N through P to change any needed information

R. When all inputs have been entered, type [N] for no further input and press [ENTER]

S. View output table

T. If you would like to work with this program more, type [Y]

U. Select the number of your choice from the alternatives presented

V. Use any appropriate alternatives to further analyze vehicle cost

W. When the final output table is displayed, type [N] to exit out of the program

(NOTE: If you decide to run additional calculations at this point, repeat steps K through W.)

X. Complete the following problems using the procedures outlined above

(NOTE: If you have difficulty with the program, start the program again. This will help you to understand use of the application.)

## JOB SHEET #7

PROBLEM #1: Determine the annual cost of owning a new vehicle and the cost of operation per mile under the following conditions.

1. The original cost of the car is $7500.00.
2. The resale price will be $3000.00.
3. The annual use will be 15,000 miles.
4. You plan to keep the car 5 years.
5. Fuel use is about 25 miles per gallon.
6. The cost of fuel is currently $1.25/gallon.
7. Interest on the value of the car is 13%.
8. License and taxes cost $75.00/year.
9. Insurance is costing you $400.00/year.
10. Tire cost is $400.00.
11. Tire life is 30,000 miles.
12. Maintenance will average about $125.00/year.

USING THESE FIGURES, CALCULATE THE FOLLOWING:

A. What is the annual cost of owning the car? ______________________

B. What is the fuel cost per mile? ______________________

C. What is the depreciation cost per mile? ______________________

D. What is the total cost per mile? ______________________

PROBLEM #2: Using the same information from problem one, what is the annual cost of operating a vehicle and the total cost per mile under the following conditions?

(NOTE: You will need to go back to the input table and enter new information.)

A. The cost of insurance goes from $400.00 to $250.00 per year because of a good driver discount.

Annual cost = ______________________
Cost per mile = ______________________

B. You bought a used car for $4000, plan to keep it for 3 years and sell it for $2300 at the end of that time.

Annual cost = ______________________
Cost per mile = ______________________

## JOB SHEET #7

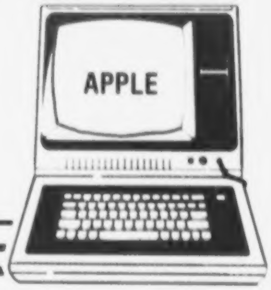
C. You bought a 4-wheel drive pickup for $13,000, plan to keep it for 4 years and sell it for $5000. Annual miles will be 6,000, gasoline will cost $1.25 per gallon; mileage is 12 MPG, tire cost is $800 and tire life is 20,000 miles; maintenance is $300.

Annual cost = ______________________________
Cost per mile = ______________________________

PROBLEM #3: Using information from your own vehicle, family vehicle, or from an example given to you by your instructor, calculate the annual cost of owning the vehicle and the cost of operation per mile. You may wish to use the farm truck as an example.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II



### JOB SHEET #8 — LOAD AND RUN AN APPLICATION PROGRAM (CHECKBOOK BALANCER)

I. Equipment and materials needed

   A. Microcomputer

   (NOTE: This job sheet has been designed to be used with any of the Apple II compatible models.)

   B. Accompanying software

   (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Insert the diskette in Disk Drive 1

   (NOTE: Hold the diskette with the square notch to the left and the label facing up.)

   B. Close the disk drive door

   C. Turn on the computer

   (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

   D. Type the number [5] designating the "Checkbook Balancer" program and press [RETURN]

   E. When asked, type your name and press [RETURN]

   F. Type current year and press [RETURN]

   G. Press [C] to continue when your name and the year are correct; if incorrect, press [R] to reenter

## JOB SHEET #8

H. Press [C] to create a file

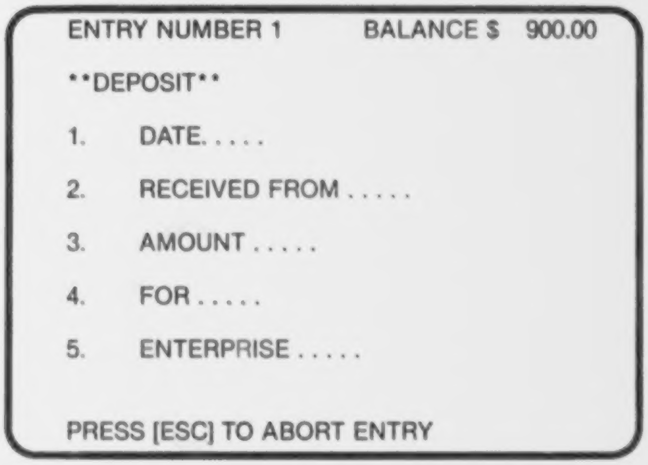
(NOTE: Once you have created and saved a file, you can retrieve it at this point by pressing [L] instead of [C].)

I. Enter your starting balance and press [Return]

(NOTE: Use the checkbook information provided in this job sheet to complete the program.)

J. To enter a deposit, use the following steps:

1. Press [D] to enter a deposit; this will produce a screen that looks like the following:



```
ENTRY NUMBER 1          BALANCE $   900.00

**DEPOSIT**

1.     DATE. . . . .

2.     RECEIVED FROM . . . . .

3.     AMOUNT . . . . .

4.     FOR . . . . .

5.     ENTERPRISE . . . . .


PRESS [ESC] TO ABORT ENTRY
```

(NOTE: If you made a mistake when you selected [D]EPOSIT, you can abort this entry by pressing the ESCcape key at this time.)

2. Enter the date and press [RETURN]

(NOTE: The date **must** be a six digit entry separated by slashes. For example, April 7, 1983 must be entered as 04/07/83.)

3. Enter the name of the individual or business that you received the money from and press [RETURN]

4. Enter the amount and press [RETURN]

5. Enter what the money was received for and press [RETURN]

6. Enter the enterprise that this deposit is associated with

(NOTE: This line may be used to code your deposit in any fashion you desire. Some examples of entries might be SWINE, WAGES, PERSONAL, or MISC. The entry may also be abbreviated to a code form such as SW for SWINE.)

## JOB SHEET #8

7. At this point the bottom of your screen should look like the following:

```
PLEASE TYPE:
      LINE NUMBER TO CHANGE
      [C] TO CONTINUE
      [ESC] TO ABORT ENTRY
```

Again, you have the option to abort this entry if you desire; if you made a mistake on a line, you can change that line by pressing the number of that line and ;making the change; if everything is correct press [C] to continue

K. Enter a check by pressing [C] for check and following the same procedure as for entering a deposit

L. Press [Q] to quit entries

(NOTE: You cannot make more than 50 entries at one time with this program. However, you can save the file, end the program, reload the file, and add up to 50 additional entries each time this is done.)

M. After pressing [Q] you will see a screen which looks like this:

```
SELECT ONE:
      [R]EVIEW AN ENTRY
      [L]IST (SCROLLS ENTRIES ON MONITOR)
      [C]ONTINUE ENTRIES
      [I]NSERT AN ENTRY
      [D]ELETE AN ENTRY
      [S]AVE THIS FILE
      [E]ND
```

N. To review an entry, use the following steps:

1. Press [R] to review a single entry

2. Enter the number of the entry to be reviewed

   (NOTE: The entry may be changed at this time.)

## JOB SHEET #8

O. Press [L] to list entries on the monitor

   1. Press [E] to view the entire list

      (NOTE: Use Control/S to start listings. By pressing Control/S again you can stop the listing for viewing. Remember, both keys must be depressed at same time.)

   2. Press [S] to sort and list

      (NOTE: You can sort ent[illegible] by the:

      [M]ONTH
      [E]NTERPRISE or code
      [P]ERSON OR BUSINESS

      by simply pressing [M], [E], or [P].)

P. Press [C] to continue entering checks and deposits

Q. Press [I] to insert an entry

   (NOTE: You might want to list the entries first to determine where you want to insert the entry.)

R. Press [D] to delete an entry

S. Press [S] to save the data from this file; this will permit you to retrieve the data from the disk at a later time

T. Press [E] to end the program and return to the disk menu

   (NOTE: If you forgot to save your file, you will be given a second chance to do so after pressing [E] to end.)

U. Complete the following problem using the procedures outlined above

   (NOTE: If you have difficulty with the program, start the program again. This will help you understand the use of the application.)

## JOB SHEET #8

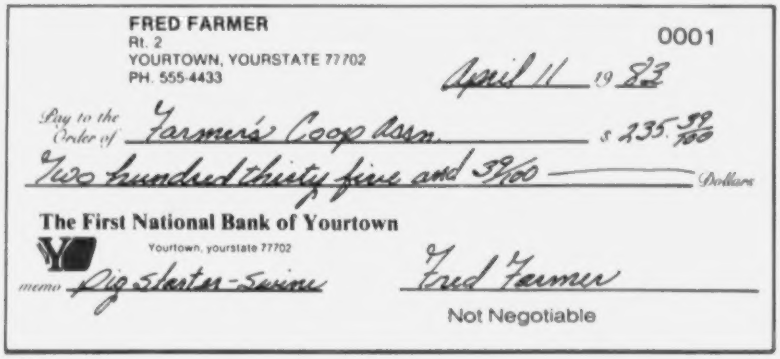
PROBLEM #1: Determine the checkbook balance using the following information.

1. The beginning balance is $900.00.

2. The following checks were written on the account:

   (NOTE: All transactions (checks or deposits) should be entered in the order in which they were completed.)

   a.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0001

April 11 19 83

Pay to the Order of Farmer's Coop Assn. $ 235.39/100

Two hundred thirty five and 39/100 Dollars

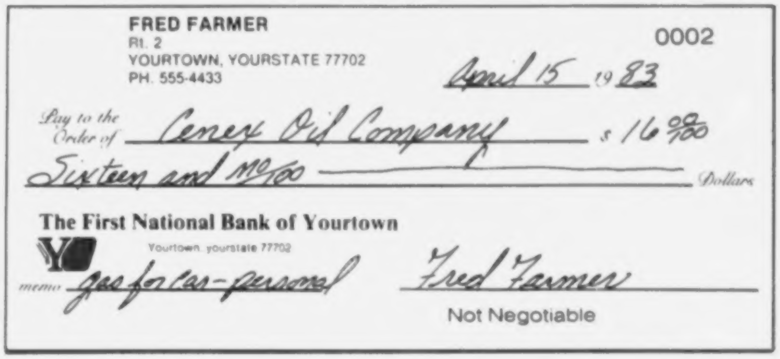
**The First National Bank of Yourtown**
Yourtown, yourstate 77702

memo Pig starter-swine

Fred Farmer

Not Negotiable

   b.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0002

April 15 19 83

Pay to the Order of Cenex Oil Company $ 16 00/100

Sixteen and no/100 Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

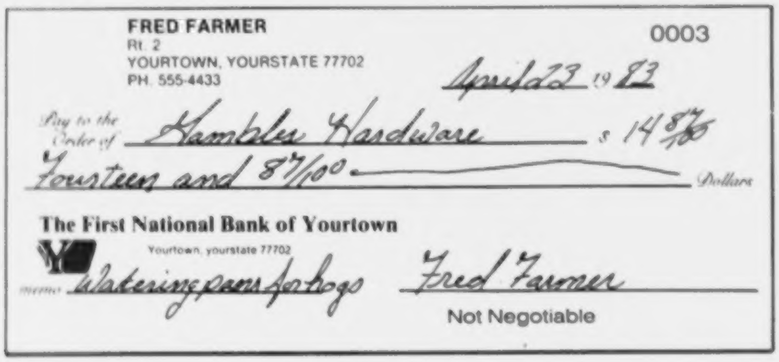
memo gas for car-personal

Fred Farmer

Not Negotiable

## JOB SHEET #8

c.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0003

April 23 19 83

Pay to the Order of Hambler Hardware $ 14 87/100

Fourteen and 87/100 Dollars

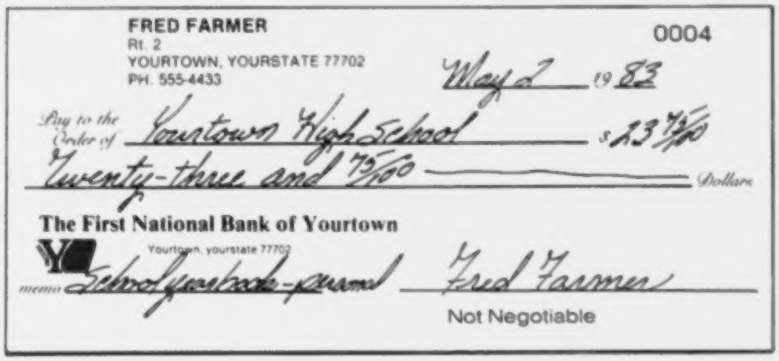
**The First National Bank of Yourtown**
Yourtown, yourstate 77702

memo Watering pans for hogs

Fred Farmer

Not Negotiable

d.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0004

May 2 19 83

Pay to the Order of Yourtown High School $ 23 75/100

Twenty-three and 75/100 Dollars

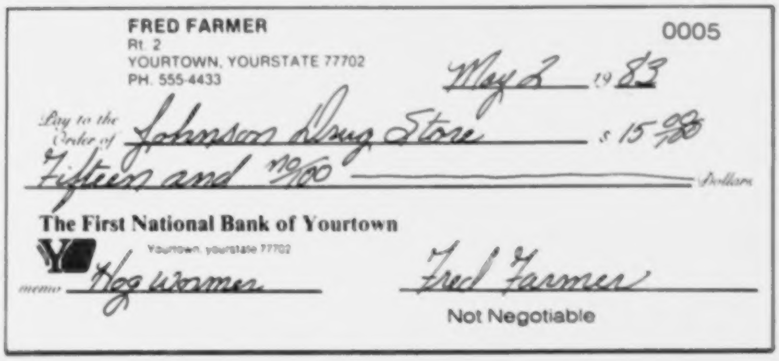
**The First National Bank of Yourtown**
Yourtown, yourstate 77702

memo School yearbook-personal

Fred Farmer

Not Negotiable

e.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0005

May 2 19 83

Pay to the Order of Johnson Drug Store $ 15 79/100

Fifteen and 79/100 Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

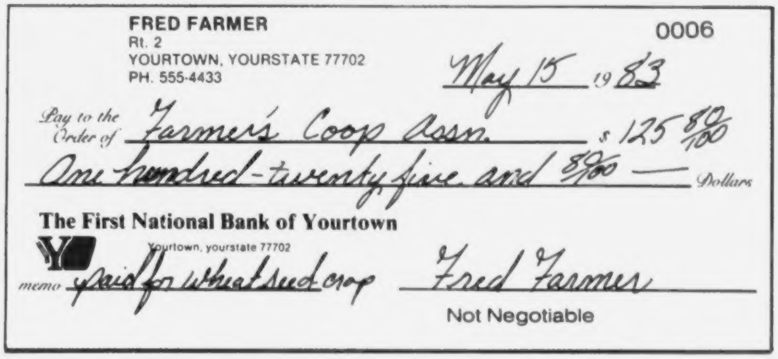
memo Hog wormer

Fred Farmer

Not Negotiable

## JOB SHEET #8

f.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0006

May 15 19 83

Pay to the Order of Farmer's Coop Assn. $ 125 80/100

One hundred-twenty five and 80/100 — Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

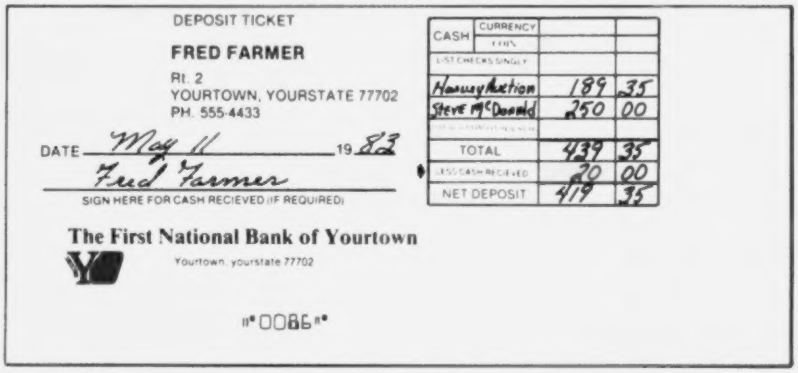
memo paid for wheat seed crop

Fred Farmer

Not Negotiable

3. The following deposit was made on this account:

Two checks were deposited to bank on May 11, 1983. One was from Harvey Auction Market for the sale of feeder pigs and one was from a neighbor, Steve McDonald, for payment of farm labor.



DEPOSIT TICKET

**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

DATE May 11 19 83

Fred Farmer
SIGN HERE FOR CASH RECIEVED (IF REQUIRED)

| | | | |
|---|---|---|---|
| CASH | CURRENCY | | |
| | COIN | | |
| LIST CHECKS SINGLY | | | |
| Harvey Auction | | 189 | 35 |
| Steve McDonald | | 250 | 00 |
| [illegible] | | | |
| TOTAL | | 439 | 35 |
| LESS CASH RECIEVED | | 20 | 00 |
| NET DEPOSIT | | 419 | 35 |

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

⑈0086⑈

NOW THAT YOU HAVE ENTERED ALL CHECKS AND DEPOSITS, GIVE THE ACCOUNT BALANCE ______________________

PROBLEM #2: Using information from your own checkbook or from any example give by your instructor, determine the account balance.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# OPERATING PROCEDURES FOR THE MICROCOMPUTER

## UNIT II

RADIO
SHACK

### JOB SHEET #8 — LOAD AND RUN AN APPLICATION PROGRAM (CHECKBOOK BALANCER)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

F. Enter the time or, if you wish to bypass this step, press [ENTER]

## JOB SHEET #8

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [5] designating the "Checkbook Balancer" program and press [ENTER]

L. When asked, type your name and press [ENTER]

M. Type current year and press [ENTER]

N. Press [C] to continue when your name and the year are correct; if incorrect, press [R] to reenter

O. Press [C] to create a file

(NOTE: Once you have created and saved a file, you can retrieve it at this point by pressing [L] instead of [C].)

P. Enter your starting balance and press [ENTER]

(NOTE: Use the checkbook information provided in this job sheet to complete the program.)

Q. To enter a deposit, use the following steps:

1. Press [D] to enter a deposit; this will produce a screen that looks like the following:

```
ENTRY NUMBER 1          BALANCE $   900.00

**DEPOSIT**

1.    DATE. . . . .

2.    RECEIVED FROM . . . . .

3.    AMOUNT . . . . .

4.    FOR . . . . .

5.    ENTERPRISE . . . . .


PRESS [0] TO ABORT ENTRY
```

(NOTE: If you made a mistake when you selected [D]EPOSIT, you can abort this entry by entering a 0 to escape.)

## JOB SHEET #8

2. Enter the date and press [ENTER]

   (NOTE: The date **must** be a six digit entry separated by slashes. For example, April 7, 1983 must be entered as 04/07/83.)

3. Enter the name of the individual or business that you received the money from and press [ENTER]

4. Enter the amount and press [ENTER]

5. Enter what the money was received for and press [ENTER]

6. Enter the enterprise that this deposit is associated with

   (NOTE: This line may be used to code your deposit in any fashion you desire. Some examples of entries might be SWINE, WAGES, PERSONAL, or MISC. The entry may also be abbreviated to a code form such as SW for SWINE.)

7. At this point the bottom of your screen should look like the following:

```
PLEASE TYPE:
        LINE NUMBER TO CHANGE
        [C] TO CONTINUE
        [0] TO CONTINUE
```

   Again, you have the option to abort this entry if you desire; if you made a mistake on a line, you can change that line by pressing the number of that line and ;making the change; if everything is correct press [C] to continue

R. Enter a check by pressing [C] for check and following the same procedure as for entering a deposit

S. Press [Q] to quit entries

   (NOTE: You cannot make more than 50 entries at one time with this program. However, you can save the file, end the program, reload the file, and add up to 50 additional entries each time this is done.)

## JOB SHEET #8

T. After pressing [Q] you will see a screen which looks like this:

```
SELECT ONE:
        [R]EVIEW AN ENTRY
        [L]IST (SCROLLS ENTRIES ON MONITOR)
        [C]ONTINUE ENTRIES
        [I]NSERT AN ENTRY
        [D]ELETE AN ENTRY
        [S]AVE THIS FILE
        [E]ND
```

U. To review an entry, use the following steps:

1. Press [R] to review a single entry
2. Enter the number of the entry to be reviewed

   (NOTE: The entry may be changed at this time.)

V. Press [L] to list entries on the monitor

1. Press [E] to view the entire list

   (NOTE: Use @ to start listings. By pressing @ and shift key you can stop the listing for viewing; remember, both keys must be depressed at same time.)

2. Press [S] to sort and list

   (NOTE: You can sort entries by the:

   [M]ONTH
   [E]NTERPRISE or code
   [P]ERSON OR BUSINESS

   by simply pressing [M], [E], or [P].)

W. Press [C] to continue entering checks and deposits

X. Press [I] to insert an entry

(NOTE: You might want to list the entries first to determine where you want to insert the entry.)

Y. Press [D] to delete an entry

Z. Press [S] to save the data from this file; this will permit you to retrieve the data from the disk at a later time

## JOB SHEET #8

AA. Press [E] to end the program and return to the disk menu

(NOTE: If you forgot to save your file, you will be given a second chance to do so after pressing [E] to end.)

BB. Complete the following problem using the procedures outlined above

(NOTE: If you have difficulty with the program, start the program again. This will help you understand the use of the application.)

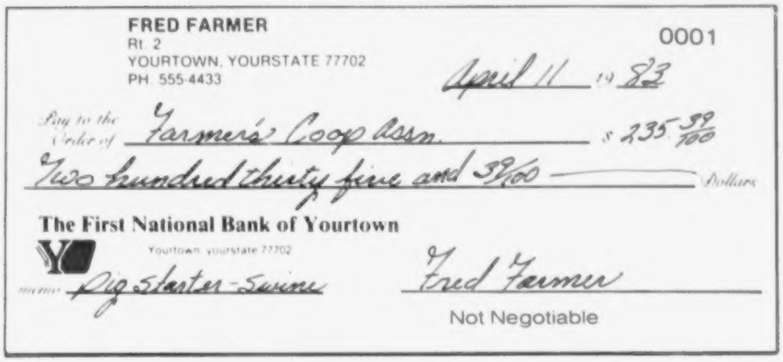
PROBLEM #1: Determine the checkbook balance using the following information.

1. The beginning balance is $900.00.

2. The following checks were written on the account:

   (NOTE: All transactions (checks or deposits) should be entered in the order in which they were completed.)

   a.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH 555-4433

0001

April 11 19 83

Pay to the Order of Farmer's Coop Assn. $ 235 39/100

Two hundred thirty five and 39/100 Dollars

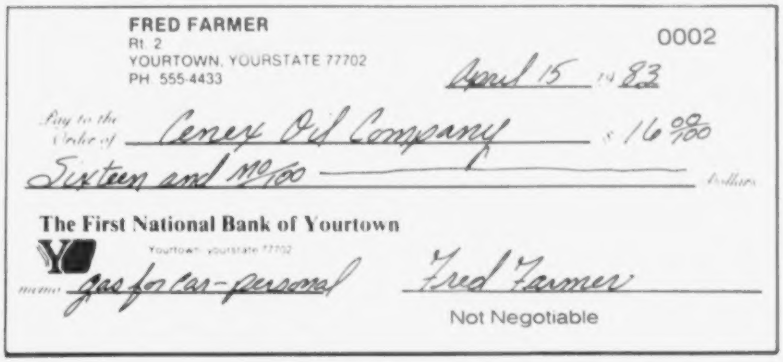
**The First National Bank of Yourtown**
Yourtown, yourstate 77702

memo Pig Starter - Swine

Fred Farmer

Not Negotiable

   b.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH 555-4433

0002

April 15 19 83

Pay to the Order of Cenex Oil Company $ 16 00/100

Sixteen and no/100 Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

memo gas for car - personal

Fred Farmer

Not Negotiable

JOB SHEET #8

c.

**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0003

April 23 19 83

Pay to the Order of Hambley Hardware $ 14 87/100

Fourteen and 87/100 Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

Memo Watering pans for hogs

Fred Farmer

Not Negotiable

d.

**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0004

May 2 19 83

Pay to the Order of Yourtown High School $ 23 75/100

Twenty-three and 75/100 Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

Memo School yearbook-personal

Fred Farmer

Not Negotiable

e.

**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0005

May 2 19 83

Pay to the Order of Johnson Drug Store $ 15 99/100

Fifteen and 99/100 Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

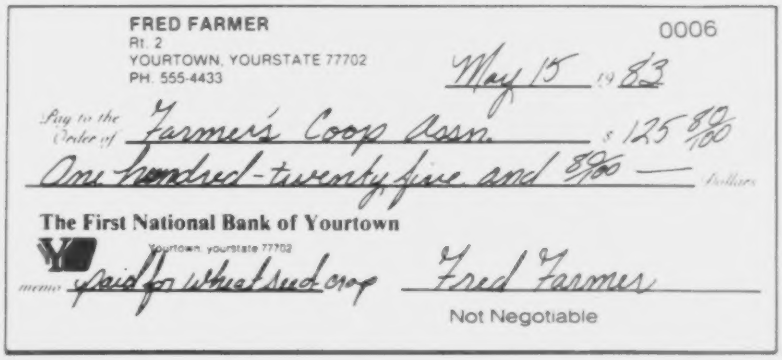
Memo Hog Wormer

Fred Farmer

Not Negotiable

## JOB SHEET #8

f.



**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

0006

May 15 19 83

Pay to the Order of Farmer's Coop Assn. $ 125 80/100

One hundred-twenty five and 80/100 — Dollars

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

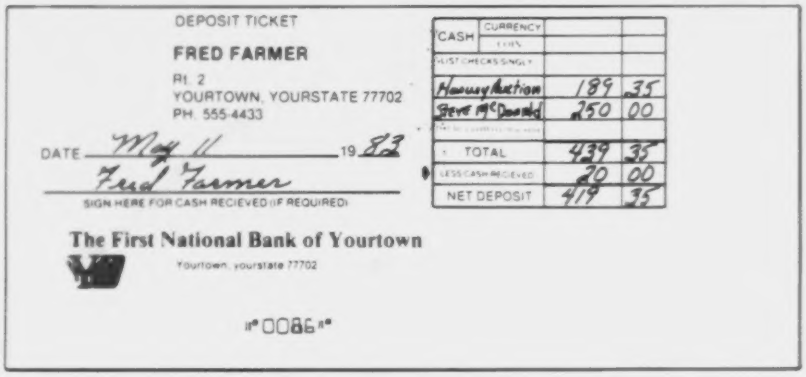
memo paid for wheat seed crop

Fred Farmer

Not Negotiable

3. The following deposit was made on this account:

Two checks were deposited to bank on May 11, 1983. One was from Harvey Auction Market for the sale of feeder pigs and one was from a neighbor, Steve McDonald, for payment of farm labor.



DEPOSIT TICKET

**FRED FARMER**
Rt. 2
YOURTOWN, YOURSTATE 77702
PH. 555-4433

DATE May 11 19 83

Fred Farmer
SIGN HERE FOR CASH RECIEVED (IF REQUIRED)

**The First National Bank of Yourtown**
Yourtown, yourstate 77702

⑈0086⑈

| | | | |
|---|---|---|---|
| CASH | CURRENCY | | |
| | COIN | | |
| LIST CHECKS SINGLY | | | |
| Harvey Auction | | 189 | 35 |
| Steve McDonald | | 250 | 00 |
| [illegible] | | | |
| TOTAL | | 439 | 35 |
| LESS CASH RECIEVED | | 20 | 00 |
| NET DEPOSIT | | 419 | 35 |

NOW THAT YOU HAVE ENTERED ALL CHECKS AND DEPOSITS, GIVE THE ACCOUNT BALANCE ______________________

PROBLEM #2: Using information from your own checkbook or from any example give by your instructor, determine the account balance.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II

## ANSWERS TO JOB SHEET PROBLEMS

### JOB SHEET #6

Problem #1

| ID# | ADG |
|---|---|
| #12 | 2.2 |
| #32 | 1.9 |
| #44 | 2.26 |

Problem #2

| ID# | ADG |
|---|---|
| #05 | 2.49 |
| #23 | 2.31 |
| #56 | 2.21 |

### JOB SHEET #7

Problem #1

a. 3132.50
b. .209
c. .137
d. .072

Problem #2

a. Annual cost = 2982.50
Cost per mile = .199

b. Annual cost = 2376.17
Cost per mile = .158

c. Annual cost = 4660.00
Cost per mile = .777

### JOB SHEET #8

Problem #1 — Account balance is $888.54

Problem #2 — Performance skills evaluated to the satisfaction of the instructor

## OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II

NAME ______________________

## TEST

1. Match the terms on the right with their correct definitions.

(NOTE: Answers to questions a.-i. appear on this page.)

_____a. Rules governing sentence structure in a language or statement structure in a language such as that of a compiler program

_____b. Storage areas used with microcomputers, minicomputers, and text-editing equipment that permit data to be read from them because they are permanently wired to perform one function or contain specific data

_____c. Controller for input/output which can be parallel (8 bits at a time) or serial (1 bit at a time)

_____d. To duplicate a file or a separate piece of media in case the original is lost

_____e. Illustrations and explanations that include both general information needed by the user of the program and the specific information needed by the computer operator or the computer programmer if the program later needs updating

_____f. The combination of specific procedures, methods, equipment, and people designed to accomplish the transition of a written, verbal, or recorded word distributed to its ultimate use

_____g. Programming language developed at Dartmouth College for use in academic computing, but widely used on microcomputers

_____h. Miniature integrated circuits which have replaced transistors

_____i. Major component of the central processing unit which performs all arithmetic and logical operations under the direction of the control unit

1. Word processing system
2. Chips
3. Documentation
4. Interface
5. BASIC
6. Arithmetic/logic unit
7. Backup
8. Read Only Memory (ROM)
9. Syntax

## TEST

(NOTE: Answers to questions j.-x. appear on this page.)

______j. Main storage areas used with microcomputers, minicomputers, and text-editing equipment into which data can be written or read

______k. Process of adding the DOS commands to the BASIC in Apple II

______l. Symbol denoting 1,024 units (bytes) of information

______m. Storage area of the computer which holds programs and data being processed

______n. Complete set of instructions that directs the computer and coordinates the operation of the various computer components

______o. Smallest unit of information that can be recognized by a computer

______p. Printed output from an information system

______q. Device that converts data into impulses and transmits them over telephone lines from the terminal to the computer and vice versa

______r. Small circuit board used to provide numerous functions depending on its purpose

______s. Major component of a computer system, responsible for processing all data handled by the system; consists of the control and arithmetic/logic unit

______t. Used in writing programs to direct processing steps carried out by a computer

______u. The unit of measure of a computer's memory; normally holds one character (usually 8 bits)

______v. Device connected to a computer to provide communication (input/output) or auxiliary functions

______w. Supplementary means for storing data

______x. Commands used in running the disk operating system (DOS)

10. K
11. Programming languages
12. Bit
13. Modem
14. Random Access Memory (RAM)
15. Auxiliary storage device
16. Boot the disk
17. Byte
18. Peripheral device
19. System commands
20. Memory
21. Central processing unit (CPU)
22. Program
23. Controller card
24. Hard copy

## TEST

(NOTE: Answers to questions y.-ee. appear on this page.)

_____y. Character which indicates position on screen; is usually represented by a blinking square or underline

_____z. List of choices or alternatives for user action; often a list of program options

_____aa. Single decimal value, letter of the alphabet, or space

_____bb. Program responsible for the housekeeping and communications between the disk storage device and the computer

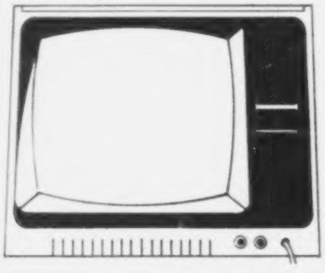
_____cc. Technique using software of microprogramming in which one computer is made to behave exactly like another

_____dd. Name for the greeting program

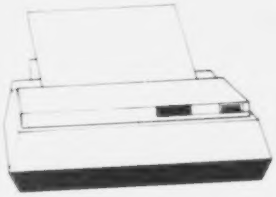
_____ee. Computer output device that produces printed copy

25. System commands
26. Cursor
27. Character
28. HELLO
29. Disk operating system
30. Emulation
31. Menu

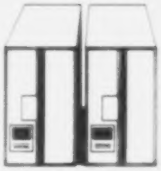
2. Identify major components of the microcomputer.



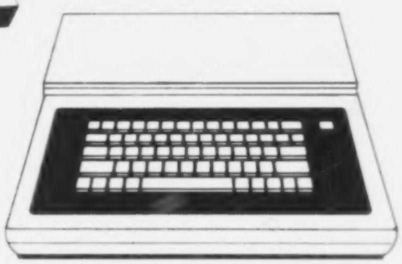
a.



b.



d.



c.

a. ______________________ c. ______________________

b. ______________________ d. ______________________

## TEST

3. Match the major microcomputer components on the right with their functions.

| | | |
|---|---|---|
| _____a. | Reads and/or writes data on floppy diskette | 1. Keyboard |
| _____b. | Displays output | 2. Monitor |
| _____c. | Outputs data onto paper | 3. Processor |
| _____d. | Processes data which is fed into system | 4. Disk drive |
| _____e. | Used to input data into the system | 5. Printer |

4. Match the processing system components on the right with their characteristics.

| | | |
|---|---|---|
| _____a. | Memory is accessed by the CPU; data entered into the computer, either by the keyboard or floppy diskette, is stored in RAM; will lose all stored data when electrical power is shut off | 1. Central processing unit (CPU) |
| _____b. | Performs all operations on the data; controls the functions of all other parts of the computer | 2. Random Access Memory (RAM) |
| _____c. | Changes current of 110-120 volts to a voltage that the computer can handle; computer uses small amounts of amperage and can be left on for long periods of time without damage | 3. Read Only Memory (ROM) |
| _____d. | Inserted into slots in side of computer; serve numerous jobs such as interfacing printers and disk drives and providing different programming languages | 4. Controller cards |
| _____e. | Used to store data that does not change; data entered into the computer by manufacturer; will retain data at all times | 5. Power transformer |

## TEST

5. Match parts of the Apple IIe keyboard on the right with their functions.

______a. Represent letters marked on each key plus a standard set of symbols

______b. Move the cursor in the direction of the arrows

______c. Used in duo with other keys on screen editing functions

______d. Causes certain other keys to have and perform third functions by holding the control key down while pressing and releasing the other key

______e. Allows continuous repetition of a second key

______f. Enters response for interpretation

______g. Numbers 0 thru 9

______h. Used only to correct problems which have caused machine to "hang up" or suspend operation

______i. Found on the lower left and lower right side of the keyboard; allows the use of the upper symbol on keys with two symbols and the upper case letter on computers that have lower and upper case letters

1. Reset
2. Esc (escape) key
3. Letter keys
4. Number keys
5. Shift keys
6. Rept (repeat) key
7. Arrow keys
8. Ctrl (control) key
9. Return key

6. Match Apple introductory system commands on the right with their functions.

______a. Name of the identification program on the disk

______b. Causes loading and execution of the program currently in memory or the program named

______c. Displays a list of all the programs available on a diskette on the screen

1. CATALOG
2. RUN
3. HELLO

# TEST

7. Match the parts of the Radio Shack keyboard on the right with their functions.

______a. Tabs over to the next eight-column boundary

______b. Numbers 0 thru 9

______c. Enters the line; BASIC will not interpret a line until ENTER is pressed

______d. Activates the printer screen function, copies the contents of the screen to the printer; press BREAK to terminate this function and return to the immediate mode

______e. Starts over at the beginning of the line

______f. Represents letters marked on each key plus a standard set of symbols

______g. Cancels the current line, erases the display, converts to 64 characters/line, and positions the cursor to the upper left corner ("HOME")

______h. Pauses program execution; press any key to continue

______i. Interrupts the current program or operation and prepares the computer for another keyboard command; used to cancel a cassette or line printer operation, or to break out of a BASIC program

______j. Backspaces and erases the last character typed

______k. Converts to 32 characters/line

1. Letter keys
2. Break key
3. Number keys
4. Clear key
5. Enter key
6. Shift, @
7. Right arrow (→)
8. Shift, down arrow, *
9. Left arrow (←)
10. Shift, right arrow
11. Shift, left arrow

8. Match Radio Shack introductory system commands on the right with their functions.

______a. Causes loading and execution of the program currently in memory or the program named

______b. Lists files available on a diskette

______c. Prepares computer to accept program, to call up information needed, or to type in new program for use

1. TRSDOS
2. DIR
3. RUN

## TEST

9. Circle the words which best complete the following statements concerning care and maintenance of the microcomputer.

   a. Provide a safe, adequate storage space with a temperature range from (30°F to 90°F, 50°F to 110°F)

   b. Protect from direct sunlight, moisture, or (dust, air)

   c. Use a (rubber glove, static mat) to control static electricity

   d. (Never pull, Pull) diskette out of disk drive when red light is on

   e. Consult (MAVCC manual, owner's manual) for proper care and maintenance procedures pertaining to a specific model

10. Complete the following list of statements concerning care and maintenance of floppy diskettes.

    a. Never bend or ______________________ diskette

    b. Keep away from ______________________ such as transformers, magnets, television sets, and radios

    c. Do not place diskette on top of ______________________ or disk drive(s)

    d. Never expose to ______________________ equipment

    e. Store in protective jackets in a ______________________ position

    f. Never touch the ______________________ of the diskette

    g. Use only a ______________________ to write on label of diskette jacket

    h. Make ______________________ copies of all program software and store originals in a safe place

11. Select true statements concerning factors to consider before duplicating copyrighted software programs by placing an "X" in the appropriate blanks.

    ______a. Many commercial programs take years of research and development as well as large amounts of capital to produce

    ______b. When commercial software is purchased, the right to use and distribute copies of the software is obtained

    ______c. An individual is permitted to make additional copies **only** for backup or archival purposes

    ______d. Giving copies of commercial software to friends is legal and encourages the development of new software

## TEST

12. Select true statements concerning system compatibilities by placing an "X" in the appropriate blanks.

    _____a. Microcomputer manufacturers have a standard version of BASIC or other programming languages which will work in other systems

    _____b. Most monitors and television sets will connect to any microcomputer; however, television sets may need an additional piece of equipment to complete the connection

    _____c. The printer must be compatible with the microcomputer

    _____d. Blank diskettes are usable in most disk drives as long as they are the same size

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

13. Demonstrate the ability to:

    a. Load and run a program using introductory system commands.

    b. Load and run a program using functional system commands.

    c. Load and run a program using fundamental system commands.

    d. Load and run a program using loop system commands.

    e. Load and run a program using data system commands.

    f. Load and run an application program (average daily gain).

    g. Load and run an application program (vehicle cost).

    h. Load and run an application program (checkbook balancer).

## OPERATING PROCEDURES FOR THE MICROCOMPUTER
## UNIT II

### ANSWERS TO TEST

1. a. 9
b. 8
c. 4
d. 7
e. 3
f. 1
g. 5
h. 2
i. 6
j. 14
k. 16
l. 10
m. 20
n. 22
o. 12
p. 24
q. 13
r. 23
s. 21
t. 11
u. 17
v. 18
w. 15
x. 19
y. 26
z. 31
aa. 27
bb. 29
cc. 30
dd. 28
ee. 25

2. a. Monitor
b. Printer
c. Keyboard
d. Disk drive

3. a. 4
b. 2
c. 5
d. 3
e. 1

4. a. 2
b. 1
c. 5
d. 4
e. 3

5. a. 3
b. 7
c. 2
d. 8
e. 6
f. 9
g. 4
h. 1
i. 5

6. a. 3
b. 2
c. 1

7. a. 7
b. 3
c. 5
d. 8
e. 11
f. 1
g. 4
h. 6
i. 2
j. 9
k. 10

## ANSWERS TO TEST

8. a. 3
   b. 2
   c. 1

9. a. 50°F to 110°F
   b. Dust
   c. Static mat
   d. Never pull
   e. Owner's manual

10. a. Fold
    b. Magnetic fields
    c. Monitor
    d. X-ray equipment
    e. Vertical
    f. Surface
    g. Felt tip pen
    h. Backup

11. a, c

12. b, c, d

13. Performance skills evaluated to the satisfaction of the instructor

# EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM

## UNIT OBJECTIVE

After completion of this unit, the student should be able to determine specific needs for an agricultural operation and evaluate and select the microcomputer system. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Define terms related to evaluating and selecting the microcomputer system.
2. Match major types of software packages with their functions.
3. Select factors to consider when evaluating and selecting software.
4. Complete a list of statements concerning factors to consider when evaluating and selecting hardware.
5. Distinguish between types of printers.
6. List factors to consider when evaluating and selecting a printer.
7. Select true statements concerning other factors to consider when selecting a microcomputer system.
8. Determine specific needs for an agricultural operation.
9. Evaluate software for the microcomputer system.
10. Evaluate hardware for the microcomputer system.

## EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM
## UNIT III

### SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information and assignment sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Discuss the importance of determining specific needs before selecting a microcomputer system. Invite a person who uses a microcomputer for agricultural applications to class to explain how specific needs are determined.

VI. Have students collect information on the various microcomputer software packages, models, and peripheral devices to use in completing Assignment Sheets #2 and #3, and in classroom discussions.

VII. Obtain samples of hard copy from the various types of printers, compare their quality, and discuss their uses.

VIII. Have students give a short presentation based on their software evaluations completed in Assignment Sheet #2 and have the class select those programs they feel are the best buys. Discuss their choices.

IX. Have students compare their hardware evaluations completed in Assignment Sheet #3 and select those models they feel are the best buys. Discuss their choices.

X. Give test.

XI. Reteach if necessary.

### INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Assignment sheets

    1. Assignment Sheet #1 — Determine Specific Needs for an Agricultural Operation

    2. Assignment Sheet #2 — Evaluate Software for the Microcomputer System

INSTRUCTIONAL MATERIALS

3. Assignment Sheet #3 — Evaluate Hardware for the Microcomputer System

D. Test

E. Answers to test

II. References:

A. Poole, Lon, Martin McNiff, and Steven Cook. *Apple II User's Guide.* Berkeley, CA: OSBORN/McGraw-Hill Book Co., 1981.

B. *Agricultural Computing Source Book.* St. Louis, MO: Doane Western, Inc., 1984.

III. Additional materials:

A. Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.

B. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984.

C. Beasley, Jack O. *Microcomputers on the Farm.* Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

# EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM
## UNIT III

## INFORMATION SHEET

I. Terms and definitions

- A. Graphics — A picture, map, or graph used for illustration; displayed by a computer as on a monitor or printer
- B. Tutorial — Written instruction providing practical information about a specific subject

  (NOTE: The demonstration (demo) is another version of instructional information available to computer users.)

II. Major types of software packages and their functions

- A. Electronic spread sheet

  Examples: VisiCalc, NovaCalc

  1. Stores and calculates financial records
  2. Stores and calculates production records
  3. Performs accounting functions
  4. Performs operator's own programs

- B. Word processing

  Examples: Scripsit, WordStar, Easy Writer

  1. Records text
  2. Formats text as desired by operator
  3. Stores text for later use
  4. Corrects spelling errors

- C. Address and file programs

  Examples: VisiFile, ProFile

  1. Stores information in files
  2. Sorts and alphabetizes
  3. Prints mailing addresses
  4. Prints file information

INFORMATION SHEET

D. Farm accounting

Examples: General ledger, computing interest

1. Stores and calculates financial records
2. Stores and calculates production records
3. Performs accounting functions

E. Decision analysis

Examples: Break-even feeder analysis, loan analysis, crop comparison

1. Inputs and analyzes pertinent information
2. Compares results for given situations
3. Provides ability to evaluate alternatives

III. Factors to consider when evaluating and selecting software (Assignment Sheet #2)

A. Program has capabilities to perform desired functions

Example: Provides output relevant to agricultural needs

B. Documentation is supplied with software

(NOTE: This should include step-by-step instructions, a tutorial, a list of programs in package, a list of program commands, and sample data.)

C. Commands are written so they are easily understood and require only single letter entry (where applicable)

D. Uniform terms are used throughout program

E. Program is menu driven

F. Program makes use of microcomputer's total capabilities

Examples: Uses clear graphics, makes use of color

G. Program can output data on printer

H. Program provides reliable results when data is inputted

I. Program identifies the error if improper data is inputted

J. Program is free from errors

K. Price should be competitive with similar programs

## INFORMATION SHEET

IV. Factors to consider when evaluating and selecting hardware (Assignment Sheet #3)

A. Software must be compatible with the hardware

B. Hardware used in training should be considered

C. Hardware should have the capabilities to perform desired functions

Examples: More RAM or additional languages can be added, has sound and graphics capabilities

D. Compatibility with other computer systems is desirable

E. Hardware should generally have at least 48K RAM to allow for future needs

(NOTE: Some software packages require up to 128K RAM.)

F. Hardware that can utilize additional disk drives may be beneficial

G. An interface is needed to connect peripheral devices

H. Printer must be compatible with the computer

I. Price should be competitive with similar models

V. Types of printers and their characteristics

A. Dot-matrix

1. Uses a matrix of pins to form characters on the printed page
2. Print speed from 60 to over 200 characters per second
3. Good graphics capabilities
4. Lower letter quality
5. Priced from $400 to $1200

B. Daisy wheel

1. Creates characters by the use of a print wheel
2. Print speed from 12 to 80 characters per second
3. Poor graphics capabilities
4. Excellent letter quality
5. Priced from $900 to over $10,000

## INFORMATION SHEET

VI. Factors to consider when evaluating and selecting a printer

(NOTE: A demonstration is the best test of printer capabilities.)

A. Quality of print

B. Speed of printer

C. Type of paper feed mechanism

D. Width of paper allowed

(NOTE: Common paper widths are 8 ½" and 14 ⅞".)

E. Ability to interface printer with microcomputer

F. Noise level and size and weight of printer

G. Accessibility of switches to change operating modes

Example: Changing operation mode from letters to checks or checks to mailing labels

H. Maintenance needed and cost of repair

Example: Changing ribbon

I. Quality of user's manual

J. Price as compared to other models with similar capabilities

VII. Other factors to consider when selecting a microcomputer system

A. Purchase the system from a reputable dealer who will provide programming help and hardware service

(NOTE: It is beneficial to purchase a system from a dealer who offers a training program as part of the purchase agreement.)

B. Choose a model that has a variety of software programs

C. Consider a hardware manufacturer who has a history of providing equipment necessary to bring older models up-to-date with the capabilities of newer models

D. Choose a model that offers a service contract which covers periodic maintenance and major repairs

E. Perform a cost/benefit analysis to determine if the machine will return the investment

## EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM
## UNIT III

## ASSIGNMENT SHEET #1 — DETERMINE SPECIFIC NEEDS FOR AN AGRICULTURAL OPERATION

Directions: The microcomputer is a management tool that can be programmed to meet specific agricultural needs. The first step when getting ready to purchase a farm computer is to determine these needs. Select an agricultural operation such as a dairy, feedlot, farm coop, or feed store, then answer the following questions.

1. What are the most important decisions that need to be made in the operation?

2. What information is needed to make these decisions?

3. What other decisions can be made using a microcomputer in the operation?

## ASSIGNMENT SHEET #1

4. Can a microcomputer collect and analyze the information needed?

5. Will the use of a microcomputer save time and money by helping to make sound management decisions?

6. Based on the needs listed above, can a microcomputer provide enough benefits to the agricultural operation to justify its cost?

# EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM
## UNIT III

## ASSIGNMENT SHEET #2 — EVALUATE SOFTWARE FOR THE MICROCOMPUTER SYSTEM

### PART A

Directions: Based on the needs established in Assignment Sheet #1, visit a reputable microcomputer dealer who sells ag-related software or use information collected by class to complete the following software checklist. Give the brand name, type of program, and price of the software being evaluated. Place an "X" in the appropriate column at the right of each statement.

Brand Name ____________________ Type of Program ____________________

*Not applicable Price ____________________

| General: | Yes | No | *N/A |
|---|---|---|---|
| 1. The program provides the desired output using specific data | | | |
| 2. Sold by a local dealer that provides good service | | | |
| 3. Software will operate on present hardware | | | |
| 4. Price is comparable to similar programs | | | |
| 5. Program is free from errors | | | |
| 6. The program can be modified | | | |

| Input: | Yes | No | *N/A |
|---|---|---|---|
| 1. Single key input where applicable | | | |
| 2. Cursor or other indicator shows where input is to go | | | |
| 3. Input can be corrected if necessary before program continues | | | |
| 4. Error diagnostics are given when improper data is inputted | | | |
| 5. The user is in control of the program at all times | | | |
| 6. Input can be edited before second run | | | |

| Output: | Yes | No | *N/A |
|---|---|---|---|
| 1. The output is in an easy to read and understand format | | | |
| 2. Produces output on a printer if desired | | | |

| Instructions: | Yes | No | *N/A |
|---|---|---|---|
| 1. Documentation is provided in the software package | | | |
| 2. The program is menu driven | | | |
| 3. User can skip instructions and return to them when needed | | | |
| 4. Text is clear and easy to read | | | |
| 5. Commands are written in simple-to-understand terms | | | |
| 6. Uniform terms are used throughout program | | | |
| 7. Sound and/or music is used effectively | | | |

## ASSIGNMENT SHEET #2

Software Documentation:

| | Yes | No | *N/A |
|---|---|---|---|
| 1. Provides easy to read "step by step" instructions | | | |
| 2. Contains a sample set of data with output for use to test program | | | |
| 3. Contains a tutorial | | | |
| 4. Provides a list of program commands | | | |
| 5. Includes features necessary for agricultural application | | | |

PART B

Directions: Answer the following questions based on the completed checklist.

1. How many questions received a "Yes" answer? ______________________________

2. How many questions received a "No" answer? ______________________________

3. Would you consider the amount of "Yes" or "No" answers significant in deciding whether to purchase the software? ______________________________

   Why? ______________________________

   ______________________________

   ______________________________

   ______________________________

   ______________________________

4. Would you purchase the software you have just evaluated? ______________________________

   Why? ______________________________

   ______________________________

   ______________________________

   ______________________________

   ______________________________

# EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM
## UNIT III

## ASSIGNMENT SHEET #3 — EVALUATE HARDWARE FOR THE MICROCOMPUTER SYSTEM

PART A

Directions: Based on the needs established in Assignment Sheet #1, visit a reputable microcomputer dealer or use information collected by the class to evaluate hardware for use in an ag-related area. Give the brand name, model, and price of the hardware being evaluated. List any additional hardware that may be needed such as a telephone modem, and the price of each item. Place an "X" in the appropriate column at the right of each statement.

Brand Name ______________________ Model __________ Price __________

Additional Hardware ________________ Price(s) __________

*Not applicable

Computer/Keyboard/Disk Drive:

| | Yes | No | *N/A |
|---|---|---|---|
| 1. Sold by a reputable dealer that provides good service | | | |
| 2. Is a name brand computer that has good software available | | | |
| 3. Has sufficient memory (at least 48-64K RAM) | | | |
| 4. Additional RAM can be added if needed | | | |
| 5. Additional languages can be added if needed | | | |
| 6. Uses disk drive | | | |
| 7. Has communications capabilities | | | |
| 8. Additional disk drives can be added if needed | | | |
| 9. Has adequate graphics capabilities | | | |
| 10. Keyboard keys are clearly marked and easy to operate | | | |
| 11. Price is comparable to similar brands | | | |

Monitor: Price __________

| | Yes | No | *N/A |
|---|---|---|---|
| 1. The picture is sharp and clear | | | |
| 2. Has 40-80 characters per column capability | | | |

Printer:

Brand Name ______________________ Type ______________

Price __________

| | Yes | No | *N/A |
|---|---|---|---|
| 1. Has the desired speed of print (Dot-matrix, 60-200 *cps; Daisy wheel, 12-80 cps) | | | |
| 2. Provides graphics capabilities (Dot-matrix, good; Daisy wheel, poor) | | | |
| 3. Provides letter quality type | | | |
| 4. Has an interface | | | |

*cps: Characters per second

## ASSIGNMENT SHEET #3

### PART B

Directions: Answer the following questions based on the completed checklist.

1. How many questions received a "Yes" answer? ______________________
2. How many questions received a "No" answer? ______________________
3. Would you consider the amount of "Yes" or "No" answers significant in deciding whether to purchase the hardware? ______________________

   Why? ______________________

   ______________________

   ______________________

   ______________________

   ______________________

4. What is the total cost of the hardware? ______________________
5. Would you purchase the hardware you have just evaluated? ______________________

   Why? ______________________

   ______________________

   ______________________

   ______________________

   ______________________

## EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM
## UNIT III

NAME ____________________

## TEST

1. Define the following terms.

   a. Graphics — ________________________________________

   ________________________________________

   b. Tutorial — ________________________________________

   ________________________________________

2. Match the major types of software packages on the right with their functions.

   (NOTE: The answers will be used more than once and some may have more than one correct answer.)

   _____a. Compares results for given situations

   _____b. Prints file information

   _____c. Corrects spelling errors

   _____d. Stores and calculates financial records

   _____e. Formats text as desired by operator

   _____f. Sorts and alphabetizes

   _____g. Performs accounting functions

   _____h. Inputs and analyzes pertinent information

   1. Electronic spread sheet
   2. Word processing
   3. Address and file programs
   4. Farm accounting
   5. Decision analysis

3. Select factors to consider when evaluating and selecting software by placing an "X" in the appropriate blanks.

   _____a. Program has capabilities to perform desired functions

   _____b. Commands are written so they are easily understood and require only single letter entry (where applicable)

   _____c. Random terms are used throughout program

   _____d. Program is menu driven

   _____e. Program makes use of few microcomputer capabilities

   _____f. Program has minimum errors

TEST

______g. Program can output data on printer

______h. Program identifies the error if improper data is inputted

______i. Price should not be compared with similar programs

4. Complete the following list of statements concerning factors to consider when evaluating and selecting hardware.

   a. Software must be compatible with the ______________________________

   b. ______________________________ with other computer systems is desirable

   c. Hardware should generally have at least ______ RAM to allow for future needs

   d. An ______________________________ is needed to connect peripheral devices

   e. ______________________________ must be compatible with the computer

5. Distinguish between types of printers by placing a "D" for dot-matrix next to the correct characteristics.

______a. Good graphics capabilities

______b. Excellent letter quality

______c. Priced from $400 to $1200

______d. Print speed from 12 to 80 characters per second

______e. Creates characters by the use of a print wheel

______f. Print speed from 60 to over 200 characters per second

______g. Priced from $900 to over $10,000

______h. Lower letter quality

TEST

6. List six factors to consider when evaluating and selecting a printer.

   a. ______________________________

   b. ______________________________

   c. ______________________________

   d. ______________________________

   e. ______________________________

   f. ______________________________

7. Select true statements concerning other factors to consider when selecting a microcomputer system by placing an "X" in the appropriate blanks.

   ______a. Purchase the system from a reputable dealer who will provide programming help and hardware service

   ______b. Choose a model that has limited software programs

   ______c. Consider a hardware manufacturer who has a history of providing equipment necessary to bring older models up-to-date with the capabilities of newer models

   ______d. Perform a cost/benefit analysis to determine if the machine will return the investment

   ______e. Choose a model that offers a limited service contract

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

8. Determine specific needs for an agricultural operation.

9. Evaluate software for the microcomputer system.

10. Evaluate hardware for the microcomputer system.

# EVALUATING AND SELECTING THE MICROCOMPUTER SYSTEM
## UNIT III

## ANSWERS TO TEST

1. a. Graphics — A picture, map, or graph used for illustration; displayed by a computer as on a monitor or printer
   b. Tutorial — Written instruction providing practical information about a specific subject

2. a. 5
   b. 3
   c. 2
   d. 1, 4
   e. 2
   f. 3
   g. 1, 4
   h. 5

3. a, b, d, g, h

4. a. Hardware
   b. Compatibility
   c. 48K
   d. Interface
   e. Printer

5. a, c, f, h

6. Any six of the following:

   a. Quality of print
   b. Speed of printer
   c. Type of paper feed mechanism
   d. Width of paper allowed
   e. Ability to interface printer with microcomputer
   f. Noise level and size and weight of printer
   g. Accessibility of switches to change operating modes
   h. Maintenance needed and cost of repair
   i. Quality of user's manual
   j. Price as compared to other models with similar capabilities

7. a, c, d

8-10. Evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN AGRICULTURE

## RESOURCE LIST

### Software

(NOTE: The following is an alphabetical list of agricultural software dealers who may be able to provide additional programs for use in the application units. Information can be obtained by writing to the addresses below.)

Ag-Com
P.O. Box 706
Muscatine, IA 52761
(319) 264-3267

Agnet
105 Miller Hall
University of Nebraska
Lincoln, NE 68583
(402) 472-7211

Ag Plus Software
906 South Main
Ida Grove, IA 51445
(712) 364-2135

Ag Pros Micro Systems
c/oFIN Computer Analysis Data Center
1999 Shepard Road
St. Paul, MN 55116
(806) 745-3011

Agratron, Ltd.
6914 Dillon
Houston, TX 77061
(713) 641-1255
(Specializes in swine software)

Agri-Computer Systems
113 N. Ninth Street
Frederick, OK 73542
(405) 335-2320

Agricultural Computer Applications
1217 Beech Lane
Davis, CA 95616
(916) 756-8946

Agricultural Management &
Economic Consulting
315 Haggerty Lane
Bozeman, MN 59715
(406) 586-0548

Agri-Data Systems, Inc.
5050 N. 19th Avenue, Suite 204
Phoenix, AZ 85015
(602) 242-7882

Agri-Education, Inc.
815 Shakespeare
P.O. Box 66
Stratford, IA 50249
(515) 838-2785

Agri Soft
1001 E. Walnut
Columbia, MO 65201
(314) 443-4316

Agri-Ware
3426 East 242nd St.
Elko, MN 55020
(612) 461-3429
(507) 388-9290

Agri Ware, Inc.
P.O. Box 1715
Hereford, TX 79045

Apple Computer Inc.
20525 Mariani Avenue
Cupertino, CA 95014
(408) 996-1010
(General Computer Use)

# RESOURCE LIST

Aurora Systems
2040 East Washington Avenue
Madison, WI 53704
(608) 249-5875
(Farm Accounting)

Bristow, Duane
Rt. 3 Box 444C
Albany, KY 42602
(606) 387-5884
(Farm Budget, Crop Cost, Income and Expense File Records)

Broussard Feeds, Inc.
110 E. Third Street
P.O. Box 2577
Lafayette, LA 70501
(318) 234-7378
(Feed Ration Pricing and Protein Calculations)

Business and Agri Services
R.R. 2, Box 118
Raymond, IL 62560
(217) 229-3584

The Computer Center
302 Commercial
Waterloo, IA 50701
(319) 232-9504

Computerized Farm
Information System
Box 302
Stillwater, MN 55082
(612) 436-7198

Computerland
2500 B South Columbia Road
Grand Forks, ND 55082
(612) 436-7198

Continental Software
12101 Jefferson Blvd.
Culver City, CA 90230
(213) 371-5612

Decision Data, Inc.
213 Lincoln Way
Ames, IA 50010
(515) 233-4807
(Farm Management Decisions, Budget Analysis, Crop Control)

The Electric Farm
Rt. 1, Box 86
Douglas, KS 67039
(316) 746-2650
(Farm Field Records)

Farm Soft
213 Lincolnway
Ames, IA 50010
(515) 233-4807

Fred's Micro Ware
Rt. #1, Box 162
Amboy, MN 56010
(507) 674-3068
(Farm Accounting, Soybean Cost Per Acre)

Great Plains Computers
113 Broadway
Fargo, ND 58102
(701) 293-8483

Harris Laboratories
624 Peach St., P.O. Box 8037
Lincoln, NE 68501
(402) 476-2811
(Corn/Soybean Management Series)

Harvest Computer Systems
203 West 11th St.
Alexandria, IN 46001
(317) 724-9527

Horizons Unlimited
5367 Sage
Edwards, CA 93523
(805) 258-8412

# RESOURCE LIST

International Bureau of
Software Testing
536 Wendell, Suite 7
Sunnyvale, CA 94086

Jarrett Agri Sales, Inc.
R.R. 1
La Pel, IN 46051
(317) 534-4937

McGraw-Hill Book Company
School Division
1221 Avenue of the Americas
New York, NY 10020
(800) 223-4180
(Profit and Loss)

Micro-Ag
R.R. 1
Princeton, IA 52766
(319) 289-4358
(Ag-Nalysis)

Micro Learningware
P.O. Box 2134
North Mankato, MN 56001
(507) 625-2205
(Farm Program, Computerized Farm Records)

Minnesota Educational Computing
Consortium (MECC)
2520 Broadway Drive
St. Paul, MN 55113
(612) 376-1118
(Agriculture, Vol. I)

Photocom Productions
P.O. Box 3135
Pismo Beach, CA 93449
(800) 321-7367

Professional Farm Software
219 Parkdale
Cedar Falls, IA 50613
(Crop Master)

Thayer, Ed
P.O. Box 271
Greenview, IL 62642
(217) 968-5825
(Swine Breeding Herds Record Program)

Vocational Agriculture Service
College of Agriculture
University of Illinois
1401 S. Maryland Drive
Urbana, IL 61801
(217) 333-3873

Wait Cattle Co.
133 Carolyn Lane
Nicholasville, KY 40356
(606) 887-1563
(Cattle Feeding, Cost, and Break-Even, Land Analysis)

Zeiller, John F.
305 Card Road
Hillsdale, MI 49242
(517) 283-2101
(Poultry Egg Production and Feed Conversion)

## RESOURCE LIST

### Publications

(NOTE: The following is an alphabetical list of publications, which may be beneficial as supplemental teaching aids and reference materials and can be obtained by writing to the addresses below.)

Agricultural Computing Source Sheet
Doane Western, Inc.
8900 Manchester Road
St. Louis, MO 63144
(314) 968-1000
Monthly newsletter for computer users in agriculture.

Apple Orchard
908 George Street
Santa Clara, CA 95050
9 issues/year. Apple users only. News, software tips included.

Byte
70 Main Street
Peterborough, NH 03458
Monthly technical magazine. Detailed descriptions of hardware, construction articles, in-depth reviews.

Call A.P.P.L.E.
304 Main Street, Suite 300
Renton, WA 98055
7 issues/year. Apple users only. News, hardware tips, programs.

Compute!
P.O. Box 5406
Greensboro, NC 26403
Monthly. For Atari, Commodore, or Apple users only. Good tutorial approach, many programs, software tips.

Computers & Electronics
One Park Avenue
New York, NY 10016
Monthly. Many do-it-yourself hardware projects. Continuing coverage of audio, consumer electronics.

Creative Computing
39 E. Hanover Ave.
Morris Plains, NJ 07950
Monthly. For Apple, Atari, Radio Shack, IBM, and Commodore users. Evaluations and applications for home and school.

Creative Computing Buyer's Guides
39 E. Hanover Ave.
Morris Plains, NJ 07950
Two per year. Spring: Software Guide. Fall: Guide to Computers and Peripherals.

Educational Computer
P.O. Box 535
Cupertino, CA 95015
Bi-monthly. Success stories, how-to classroom applications, reviews.

Electronic Learning
902 Sylvan Avenue
Englewood Cliffs, NJ 07632
8 issues/year. Published by Scholastic. Lots of teacher contributions and reviews.

Instructional Innovator
1126 16th Street N.W.
Washington, D.C. 20036
Monthly. Covers audio visual, computers, and other related technology for schools.

Interface Age
16734 Marquardt Ave.
Cerritos, CA 90701
Monthly. Has moved toward primarily a business orientation. Good comparison charts of hardware and software.

# RESOURCE LIST

Media & Methods
1511 Walnut Street
Philadelphia, PA 19102
9 issues/year. Aimed at elementary/secondary schools; covers audio/video as well as computers.

Microcomputer Index
2464 El Camino Real #247
Santa Clara, CA 95051
Quarterly. One-line descriptions of all articles, reviews, and programs in 39 magazines.

MicroDiscovery
P.O. Box 7500
Bergenfield, NJ 07621
Monthly. For beginners. Articles, tutorials, news. Very low level and non-technical.

PC
39 East Hanover Avenue
Morris Plains, NJ 07950
Monthly. IBM personal computer and clones. Huge magazine with articles, reviews of peripherals and software.

PC World
555 DeHaro Street
San Francisco, CA 94107
Monthly. IBM personal computer only. Articles, stories, reviews about IBM PC and look-alikes.

Personal Computing
50 Essex Street
Rochelle Park, NJ 07662
Monthly. Business orientation with some items for home and education. Many articles and success stories. Some reviews.

Personal Software
Hayden Publishing Co., Inc.
50 Essex Street
Rochelle Park, NJ 07662
Monthly. News, reviews.

Popular Computing
70 Main Street
Peterborough, NH 03458
Monthly. Orientation to beginners. Nice graphic presentation. Novice-level tutorials.

School Microware Reviews
P.O. Box 246
Dresden, ME 04342
3 issues/year. Collection of software reviews for elementary/secondary level. Best of its kind. Publishes directory also.

Softalk
11021 Magnolia Blvd.
North Hollywood, CA 91601
Monthly. Apple only. Cram full of articles, stories, reviews, programs, tutorials, hints.

Softalk for IBM Personal Computer
11021 Magnolia Blvd.
North Hollywood, CA 91601
Monlthly. Programs, industry gossip, new product information.

Softside
6 South Street
Milford, NH 03055
Monthly. Program listings for TRS-80, Apple, and Atari. Somewhat inner directed with little outside advertising.

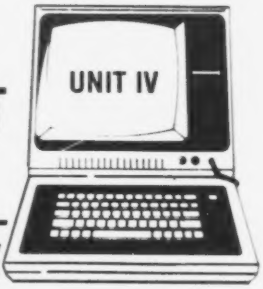
80 Micro
80 Pine Street
Peterborough, NH 03458
Monthly. TRS-80 only. The bible for Radio Shack owners. Programs, tutorials, hardware hints, stories.

## RESOURCE LIST

80-U.S. Journal
3838 South Warner Street
Tacoma, WA 98409
Monthly. TRS-80 only. Technical information, programs, reviews.

99'er
P.O. Box 5537
Eugene, OR 97405
Monthly. Texas Instruments only. Hints, programs, news, reviews.

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT



## UNIT OBJECTIVE

After completion of this unit, the student should be able to select people who use the microcomputer for farm business management, determine appropriate software for use in managing the farm business, and run application programs. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment and job sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Select people who use the microcomputer in farm business management.
2. Select true statements concerning reasons for using a microcomputer in farm business management.
3. Match areas of farm business management with appropriate software.
4. Select sources of microcomputer software for farm business management.
5. Determine specific sources of farm business management software.
6. Demonstrate the ability to:
    a. Run an application program related to farm business management (breakeven feeder analysis).
    b. Run an application program related to farm business management (accelerated cost recovery program).

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

## SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information, assignment, and job sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Provide Apple II, Apple II Plus, Apple IIe, or Radio Shack III or IV microcomputer for use with software.

VI. Practice using the software developed for this unit to make sure the procedures are understood prior to teaching in class.

VII. Demonstrate and discuss procedures outlined in the job sheets.

VIII. Use advanced students as group leaders to work with other students in running programs.

IX. Discuss benefits of setting long range goals and objectives in farm record keeping and how a microcomputer can be used in setting these goals.

X. Have an accountant visit class to explain the benefits of using a microcomputer in farm business management.

XI. Invite a farmer/farm manager/agribusiness manager who is using a computerized farm record system to class to discuss the advantages and disadvantages of a computerized system.

XII. Provide spread sheets for class to use as examples of financial information to be obtained from the computer.

XIII. Discuss how the use of a microcomputer in keeping farm business records could apply to the students in keeping accurate records for SOEP if appropriate.

XIV. Invite software dealer(s) to demonstrate farm business management software.

XV. Provide each student with adequate time to complete the accompanying software programs.

XVI. Have students run other software programs which are available.

(NOTE: See resource list which is included in introductory material.)

## SUGGESTED ACTIVITIES

XVII. Give test.

XVIII. Reteach if necessary.

XIX. Provide additional practice time if needed.

## INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Transparency masters

    1. TM 1 — People Who Use the Microcomputer in Farm Business Management

    2. TM 2 — Sources of Microcomputer Software (Farm Business Management)

  D. Assignment Sheet #1 — Determine Specific Sources of Farm Business Management Software

  E. Job sheets

    1. Job Sheet #1 — Run an Application Program Related to Farm Business Management (Break-even Feeder Analysis)

    2. Job Sheet #2 — Run an Application Program Related to Farm Business Management (Accelerated Cost Recovery System)

  F. Test

  G. Answers to test

II. References:

  A. Hodgens, Jim, and Leland Myers. *Farm Business Management, Year One*. Stillwater, OK: Oklahoma State Board of Vocational and Technical Education, 1979.

  B. Sonka, Steven T. *Computers in Farming*. New York: McGraw-Hill Book Co., 1983.

## INSTRUCTIONAL MATERIALS

III. Additional materials:

A. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984.

B. Beasley, Jack O. *Microcomputers on the Farm.* Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

C. *Agricultural Computing Source Book.* St. Louis, MO: Doane Western, Inc., 1984.

D. Agri-Education, Inc., 815 Shakespeare, Stratford, Iowa 50249.

(NOTE: Agri-Education, Inc., is a software distributor of agriculture computer programs designed for educational purposes. The following programs are available in farm business management.)

1. Deere (FMO) Machinery Management
2. Secretary of Agriculture, Farm/Ranch Accounting Package

E. Microcomputer Programs in Agriculture. Vocational Agriculture Service, University of Illinois, 1401 S. Maryland Drive, Urbana, Illinois 61801.

(NOTE: The following programs are designed to run on the Commodore Pet, Apple II Plus, and Radio Shack TRS-80 Model III machines.)

1. Cash Flow
2. Depreciation Program
3. Income Possibilities
4. Grain Marketing
5. Farm Management Record Keeping (TRS-80 Model III only)
6. Machinery Economic Decisions

## MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

### INFORMATION SHEET

(NOTE: The management of a farm calls for the ability to make decisions. The success of the farm manager is determined by the ability to use resources to achieve both monetary and non-monetary objectives. Because of the scope of information used in this area, the microcomputer can have more applications for helping to make these decisions than in any other single area of agriculture.)

I. People who use the microcomputer in farm business management (Transparency 1)

  A. Farmers and ranchers

  B. Farm and ranch managers

  C. Extension agents

  D. College of Agriculture personnel

  E. Vocational agriculture instructors

  F. Agricultural loan officers

  G. Government officials

  (NOTE: Government agencies, both state and federal, might be added to this list.)

  H. Agricultural consultants

II. Reasons for using a microcomputer in farm business management

  A. To document financial information

  (NOTE: This can help with the processing of income tax records and verifying financial records in order to establish credit and/or make investments.)

  B. To provide information to be used in making decisions regarding the management of the farm enterprise

## INFORMATION SHEET

III. Areas of farm business management and appropriate software

(NOTE: The microcomputer in no way takes the place of the personal knowledge and skills needed in farm business management. The software listed below are not intended to be inclusive of all the programs available. With new companies and increased knowledge of both hardware and software, many other topics can be added to the following examples.)

A. Record keeping

(NOTE: Record keeping develops skills in keeping farm records for use in identifying and analyzing strengths and weaknesses, decision-making, credit standing, financial performance, history of the farm, legal purposes, figuring income and Social Security taxes, and government programs.)

1. Annual/monthly financial statements
2. Income statements
3. Payroll
4. Electronic spread sheet

B. Credit planning and analysis

(NOTE: Credit planning and analysis uses financial statements to determine the need for credit, cost of credit from alternative sources, and payback capabilities of the enterprise.)

1. Financial statements
2. Loan activity reports
3. Loan analysis
4. Calculating interest

C. Development and evaluation of long-term plans

(NOTE: These plans help to achieve farm and family goals by using available resources to evaluate the various alternatives.)

1. Budgets
2. Cash flow projections
3. Scheduling irrigation application

## INFORMATION SHEET

4. Crop rotation
5. Economics of grain storage
6. Land purchase analysis

D. Income tax management

(NOTE: Income tax management maximizes after-tax income and stabilizes income from year to year.)

1. Tax reports
2. Figuring Social Security
3. Documenting income tax liabilities
4. Depreciation schedules (ACRS)

**(NOTE: The accompanying software for this unit includes a program for accelerated cost recovery system.)**

E. Financial management

(NOTE: Financial management identifies strengths and weaknesses of the farm business, assesses financial progress, and makes necessary corrections to improve future profitability of the farm business.)

1. General ledger
2. Accounts payable/receivable
3. Break-even analysis
4. Payroll
5. Cash flow

**(NOTE: The accompanying software for this unit includes a program for break-even feeder analysis.)**

## INFORMATION SHEET

F. Marketing strategies

(NOTE: Marketing strategies assess advantages and disadvantages of contracting, hedging, and other marketing strategies, then select the best alternatives in keeping with the firm's position, attitude toward risk, and farm and family goals.)

1. Hedging alternatives
2. Inventory register
3. Analyzing government farm programs
4. Market planning
5. Accessing marketing information
6. Charting

G. Machinery management

(NOTE: This area evaluates machinery size and efficiency within farm constraints, and considers machinery cost, replacements, and purchases.)

1. Analyzing the equipment purchase
2. Lease versus purchase
3. Depreciation schedules
4. Maintenance scheduling

H. Estate planning

(NOTE: Estate planning minimizes transfer costs consistent with the goals of the owner.)

1. Estate taxes
2. Land transfer analysis

I. Risk management

(NOTE: Risk management reduces variability of income through flexibility, diversification, skillful marketing, financial reserves, insurance, and other strategies.)

1. Evaluating purchase of feeder pigs

## INFORMATION SHEET

   2. Comparison of protein sources
   3. Evaluating price variations

J. Farm business organization

(NOTE: This area surveys alternative forms of business organization.)

   1. Filing system
   2. Scheduling
   3. Word processing
   4. Computerized check writer

IV. Sources of microcomputer software for farm business management (Transparency 2; Assignment Sheet #1)

A. Commercial vendors

B. College of Agriculture departments

C. Extension service

D. Computer user groups

E. Agricultural magazines/newsletters

F. Custom software

(NOTE: This is software which is developed for a specific use or purpose.)

G. Personal programming

(NOTE: By learning and using basic programming skills, an individual can develop new programs or adapt custom software to fit specific needs.)

H. Time-sharing systems

Examples: AGNET, CMNET, OASIS, SOURCE, AGRISTAR

# People Who Use the Microcomputer in Farm Business Management

Government Officials

Vo-Ag Instructors

Extension Agents

Agricultural Consultants

Farm Business
Management

College of Agriculture Personnel

Agricultural Loan Officers

Farm and Ranch Managers

Farmers and Ranchers

# Sources of Microcomputer Software (Farm Business Management)

College of Agriculture Departments

Commercial Vendors

Custom Software

Personal Programming

Farm Business
Management

Computer User Groups

Extension Service

Time-Sharing Systems

Agricultural Magazines/Newsletters

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

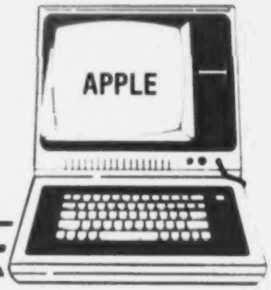
## ASSIGNMENT SHEET #1 — DETERMINE SPECIFIC SOURCES OF FARM BUSINESS MANAGEMENT SOFTWARE

Directions: Determine specific sources of farm business management software which are readily available in your area. Be specific with information which will help you in obtaining the actual software when its use becomes necessary. Use the form provided on the back of this page to complete the assignment.

## ASSIGNMENT SHEET #1

| SOURCES OF SOFTWARE (Company name, address, phone, and contact person) | NAME OF PROGRAM | HARDWARE REQUIRED | PURPOSE OF SOFTWARE | COST | FEATURES |
|---|---|---|---|---|---|
| | | | | | |

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV



## JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO FARM BUSINESS MANAGEMENT (BREAK-EVEN FEEDER ANALYSIS)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet had been designed to be used with any of the APPLE II compatible models.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Insert the diskette in Disk Drive 1

B. Close the disk drive door

C. Turn on the computer

(NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

D. Type the number [6] designating the "Breakeven Feeder Analysis" program and press [RETURN]

E. Follow the procedures outlined in the program

F. Complete the following problems

(NOTE: Do not use $ or other punctuation, except for decimals, when inputting information.)

## JOB SHEET #1

**PROBLEM #1**: Determine the break-even cost for raising feeder cattle under the following conditions.

1. The initial weight averages 440 lbs.
2. Your cost will be $63.50/cwt.
3. You will feed them to a weight of 700 lbs.
4. Your expected selling price will be $61.75/cwt.
5. Your expected death loss will be 1%.
6. Interest on your money is 15.8%.

You will be using a corn, alfalfa hay and silage ration. Use the following figures for calculating feed costs:

(NOTE: You may need to cancel out already existing feed in table. Remember, 1000 lb. = 100 cwt.)

1. Corn will cost $4.91/bu. and will require 2.75 pounds per day.
2. Alfalfa hay will cost $66.00/ton and will require 11.765 lbs. per day.
3. Corn silage will cost $21.00/ton and require .0153 lbs. per day.

Using these figures, calculate the following:

A. Feed cost-cwt. of net gain? ______________________

B. Total feed cost per head? ______________________

C. Total cost per head? ______________________

D. Selling price to cover all variable costs? ______________________

E. Selling price to cover all costs? ______________________

F. Anticipated profit over all costs (per head)? ______________________

## JOB SHEET #1

PROBLEM #2: Using the same information from problem one, what is the effect on the selling (break-even) price needed to cover all cost when the following occurs?

(NOTE: You will need to go back to the input table to put new information into the table.)

A. Initial cost will be $67.00/cwt.
Expected selling price will be $60.00/cwt.

Selling price to cover all costs = __________
Anticipated profit over all costs (per head) = __________

B. Initial cost will be $60.00/cwt.
Expected selling price will be $64.00/cwt.

Selling price to cover all costs = __________
Anticipated profit over all costs (per head) = __________

PROBLEM #3: Using information from your own farming program or from an example given to you by your instructor, calculate the break-even cost for feeder cattle. Use accurate information obtained from the latest market reports for your inputs

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

RADIO
SHACK

### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO FARM BUSINESS MANAGEMENT (BREAK-EVEN FEEDER ANALYSIS)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet had been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #1

F. Enter the time or, if you wish to bypass this step, press [RETURN]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [6] designating the "Break-even Feeder Analysis" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

(NOTE: Do not use $ or other punctuation, except for decimals, when inputting information.)

PROBLEM #1: Determine the break-even cost for raising feeder cattle under the following conditions.

1. The initial weight averages 440 lbs.
2. Your cost will be $63.50/cwt.
3. You will feed them to a weight of 700 lbs.
4. Your expected selling price will be $61.75/cwt.
5. Your expected death loss will be 1%.
6. Interest on your money is 15.8%.

You will be using a corn, alfalfa hay and silage ration. Use the following figures for calculating feed costs:

(NOTE: You may need to cancel out already existing feed in table. Remember, 1000 lb. = 100 cwt.)

1. Corn will cost $4.91/bu. and will require 2.75 pounds per day.
2. Alfalfa hay will cost $66.00/ton and will require 11.765 lbs. per day.
3. Corn silage will cost $21.00/ton and require .0153 lbs. per day.

Using these figures, calculate the following:

A. Feed cost-cwt. of net gain? ____________________

B. Total feed cost per head? ____________________

## JOB SHEET #1

C. Total cost per head? ________________

D. Selling price to cover all variable costs? ________________

E. Selling price to cover all costs? ________________

F. Anticipated profit over all costs (per head)? ________________

PROBLEM #2: Using the same information from problem one, what is the effect on the selling (break-even) price needed to cover all cost when the following occurs?

(NOTE: You will need to go back to the input table to put new information into the table.)

A. Initial cost will be $67.00/cwt.
Expected selling price will be $60.00/cwt.

Selling price to cover all costs = __________
Anticipated profit over all costs (per head) = __________

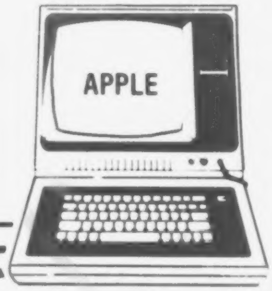
B. Initial cost will be $60.00/cwt.
Expected selling price will be $64.00/cwt.

Selling price to cover all costs = __________
Anticipated profit over all costs (per head) = __________

PROBLEM #3: Using information from your own farming program or from an example given to you by your instructor, calculate the break-even cost for feeder cattle. Use accurate information obtained from the latest market reports for your inputs

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV



### JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO FARM BUSINESS MANAGEMENT (ACCELERATED COST RECOVERY SYSTEM)

I. Equipment and materials needed

- A. Microcomputer

  (NOTE: This job sheet had been designed to be used with any of the APPLE II compatible models.)

- B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

- A. Insert the diskette in Disk Drive 1
- B. Close the disk drive door
- C. Turn on the computer

  (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

- D. Type the number [7] designating the "Accelerated Cost Recovery System" program and press [RETURN]
- E. Follow the procedures outlined in the program
- F. Complete the following problems

  (NOTE: Do not use $ or other punctuation, except for decimals, when inputting information.)

## JOB SHEET #2

PROBLEM #1: Determine the annual depreciation and year-end value for the following items, using the ACRS and straight line method of depreciation.

Name of item — Four-wheel drive pickup
Adjusted basis of pickup — $12000
ACRS property class — 3 years
Year to begin schedule — Current year

a. ACRS method — Four-wheel drive pickup

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |

b. Straight line method — Four-wheel drive pickup

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

## JOB SHEET #2

PROBLEM #2:

Name of item — Hereford bull
Cost of bull — $4500
ACRS property class — 5 years
Year to begin schedule — Current year

a. ACRS method — Hereford bull

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

b. Straight line method — Hereford bull

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**PROBLEM #3: Using information from home, farm, or from an example given to you by your instructor, calculate the annual depreciation and year-end value.**

**(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)**

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

RADIO
SHACK

### JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO FARM BUSINESS MANAGEMENT (ACCELERATED COST RECOVERY SYSTEM)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet had been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Turn the computer on

  (NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

  B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

  **(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

  C. Close the disk drive door

  D. Press the [RESET] button

  (NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

  E. Enter the date and press [ENTER]

  Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #2

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [7] designating the "Accelerated Cost Recovery System" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

(NOTE: Do not use $ or other punctuation, except for decimals, when inputting information.)

PROBLEM #1: Determine the annual depreciation and year-end value for the following items, using the ACRS and straight line method of depreciation.

Name of item — Four-wheel drive pickup
Adjusted basis of pickup — $12000
ACRS property class — 3 years
Year to begin schedule — Current year

a. ACRS method — Four-wheel drive pickup

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |

## JOB SHEET #2

b. Straight line method — Four-wheel drive pickup

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

PROBLEM #2:

Name of item — Hereford bull
Cost of bull — $4500
ACRS property class — 5 years
Year to begin schedule — Current year

a. ACRS method — Hereford bull

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

b. Straight line method — Hereford bull

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## JOB SHEET #2

PROBLEM #3: Using information from home, farm, or from an example given to you by your instructor, calculate the annual depreciation and year-end value.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

## ANSWERS TO JOB SHEET PROBLEMS

### JOB SHEET #1

Problem #1

a. 20.95
b. 54.47
c. 384.41
d. 52.82
e. 54.91
f. 47.88

Problem #2

a. Selling price to cover all costs = **57.21**
Anticipated profit over all costs (per head) = **19.53**

b. Selling price to cover all costs = **52.61**
Anticipated profit over all costs (per head) =**$79.73**

Problem #3 — Performance skills evaluated to the satisfaction of the instructor

### JOB SHEET #2

Problem #1

a.

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| 1983 | 3000 | 9000 |
| 1984 | 4560 | 4440 |
| 1985 | 4440 | 0 |

b.

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| 1983 | 2000 | 10000 |
| 1984 | 4000 | 6000 |
| 1985 | 4000 | 2000 |
| 1986 | 2000 | 0 |

## ANSWERS TO JOB SHEET PROBLEMS

Problem #2

a.

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| 1983 | 675 | 3825 |
| 1984 | 990 | 2835 |
| 1985 | 945 | 1890 |
| 1986 | 945 | 945 |
| 1987 | 945 | 0 |

b.

| TAX YEAR | ANNUAL DEPRECIATION | YEAR-END VALUE |
|---|---|---|
| 1983 | 450 | 4050 |
| 1984 | 900 | 3150 |
| 1985 | 900 | 2250 |
| 1986 | 900 | 1350 |
| 1987 | 900 | 450 |
| 1988 | 450 | 0 |

Problem #3 — Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

NAME ______________________

## TEST

1. Select people who use the microcomputer in farm business management by placing an "X" in the appropriate blanks.

   _____a. Extension agents

   _____b. Government officials

   _____c. Truck drivers

   _____d. Insurance agents

   _____e. Agricultural loan officers

   _____f. Farmers and ranchers

   _____g. Vocational agriculture instructors

   _____h. Equipment dealers

   _____i. Agricultural consultants

   _____j. Farm and ranch managers

2. Select true statements concerning the reasons for using a microcomputer in farm business management by placing an "X" in the appropriate blanks.

   _____a. To verify customer accounts

   _____b. To provide information to be used in making decisions regarding the management of the farm enterprise

   _____c. To document financial information

# TEST

3. Match the areas of farm business management on the right with the appropriate software.

(NOTE: Some answers may be used more than once.)

______a. Annual/monthly financial statements
______b. Market planning
______c. Figuring Social Security
______d. Break-even analysis
______e. Filing system
______f. Comparison of protein sources
______g. Estate taxes
______h. Analyzing the equipment purchase
______i. Cash flow projections
______j. Loan analysis
______k. Crop rotation
______l. Charting
______m. Land transfer analysis
______n. Maintenance scheduling
______o. Evaluating price variations

1. Credit planning and analysis
2. Marketing strategies
3. Income tax management
4. Record keeping
5. Machinery management
6. Estate planning
7. Risk management
8. Development and evaluation of long-term plans
9. Financial management
10. Farm business organization

4. Select sources of microcomputer software for farm business management by placing an "X" in the appropriate blanks.

______a. Custom software
______b. Commercial vendors
______c. Computer user groups
______d. Television
______e. Personal programming
______f. Textbooks

TEST

_____g. Time-sharing systems

_____h. College of Agriculture departments

_____i. Extension service

_____j. Agricultural magazines/newsletters

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

5. Determine specific sources of farm business management software.

6. Demonstrate the ability to:

   a. Run an application program related to farm business management (break-even feeder analysis).

   b. Run an application program related to farm business management (accelerated cost recovery program).

# MICROCOMPUTER APPLICATIONS IN FARM BUSINESS MANAGEMENT
## UNIT IV

## ANSWERS TO TEST

1. a, b, e, f, g, i, j

2. b, c

3.

| | | | | | |
|---|---|---|---|---|---|
| a. | 4 | f. | 7 | k. | 8 |
| b. | 2 | g. | 6 | l. | 2 |
| c. | 3 | h. | 5 | m. | 6 |
| d. | 9 | i. | 8 | n. | 5 |
| e. | 10 | j. | 1 | o. | 7 |

4. a, b, c, e, g, h, i, j

5. Evaluated to the satisfaction of the instructor

6. Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE

## UNIT OBJECTIVE

After completion of this unit, the student should be able to select people who use the microcomputer for animal science applications, determine appropriate software for use with animal science applications, and run application programs. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment and job sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Complete a list of types of livestock for which programs might be developed.
2. Select people who use the microcomputer in animal science applications.
3. Circle the words which best complete reasons for using a microcomputer in animal science.
4. List examples of software which might be used in animal science.
5. Select sources of microcomputer software for animal science.
6. Determine specific sources of animal science software.
7. Demonstrate the ability to:
    a. Run an application program related to animal science (lamb yield grade).
    b. Run an application program related to animal science (dairy cow purchase analysis).

# MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE
## UNIT V

## SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information, assignment, and job sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Provide resources for use by the students when completing Assignment Sheet #1.

VI. Demonstrate and discuss procedures outlined in the job sheets.

VII. Provide access to computer for practice in running the application programs.

VIII. Use advanced students as group leaders to work with students in running programs.

IX. Invite a local farmer, rancher, or feedlot operator to class to discuss some of the benefits of using a microcomputer in the livestock operation.

X. Show examples of some of the types of reports that can be received by using a microcomputer in the animal science area.

XI. Invite a university livestock representative or extension specialist to class to discuss their uses for a microcomputer.

XII. Provide each student with adequate time to complete the accompanying software programs.

XIII. Have students run other software programs which are applicable to animal science.

(NOTE: See resource list which is included in introductory material.)

XIV. Give test.

XV. Reteach if necessary.

XVI. Provide additional practice time if needed.

## INSTRUCTIONAL MATERIALS

I. Included in this unit:

A. Objective sheet

B. Information sheet

## INSTRUCTIONAL MATERIALS

C. Transparency masters

   1. TM 1 — People Who Use the Microcomputer in Animal Science Applications

   2. TM 2 — Sources of Microcomputer Software (Animal Science)

D. Assignment Sheet #1 — Determine Specific Sources of Animal Science Software

E. Job sheets

   1. Job Sheet #1 — Run an Application Program Related to Animal Science (Lamb Yield Grade)

   2. Job Sheet #2 — Run an Application Program Related to Animal Science (Dairy Cow Purchase Analysis)

F. Test

G. Answers to test

II. Suggested materials

A. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984.

B. Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.

C. Beasley, Jack O., *Microcomputers on the Farm.* Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

D. *Agricultural Computing Source Book.* St. Louis, MO: Doane Western, Inc., 1984.

E. Agri-Education, Inc., 815 Shakespeare, Stratford, IA 50249.

(NOTE: Agri-Education, Inc., is as software distributor of agricultural computer programs designed for educational purposes. The following programs are available in animal science.)

   1. Manure Management

   2. High Moisture Grain

   3. Forage Handling

   4. Feedlot Design

## INSTRUCTIONAL MATERIALS

F. Microcomputer Programs in Agriculture. Vocational Agriculture Service, University of Illinois, 1401 S. Maryland Drive, Urbana, IL. 61801.

(NOTE: The following programs are designed to run on the Commodore Pet, Apple II Plus, and Radio Shack TRS-80 Model III machines.)

1. Livestock Budget
2. Calf Weaning Weights

# MICROCOMPUTER APPLICATIONS IN
# ANIMAL SCIENCE
# UNIT V

## INFORMATION SHEET

I. Types of livestock for which programs might be developed

- A. Beef
- B. Dairy cattle
- C. Sheep
- D. Swine
- E. Dairy goats
- F. Horses
- G. Rabbits
- H. Fish
- I. Fur-bearing animals
- J. Poultry

II. People who use the microcomputer for animal science applications (Transparency 1)

- A. Farmers and ranchers
- B. Farm and ranch managers
- C. Feed dealers and manufacturers
- D. Representatives of breed associations
- E. Extension agents
- F. University researchers
- G. Consultants from marketing news services
- H. Vocational agriculture instructors
- I. Veterinarians

## INFORMATION SHEET

III. Reasons for using a microcomputer in animal science

   A. To keep accurate records

      (NOTE: Accurate records pertaining to animal science provide a means for being able to make decisions regarding the farm enterprise. These records may apply not only to the livestock, but also to the equipment, facilities, feeds, and any other items which affect livestock production.)

   B. To document financial information

      (NOTE: This can help with the processing of income tax records and verifying financial records in order to establish credit and/or make investments.)

   C. To simulate possible course of action prior to making decisions

   D. To help make marketing decisions

IV. Examples of software which might be used in animal science

   A. Records and analysis

      1. Formulating and analyzing rations

      2. Recording and analyzing production records

         Examples: Breeding records, feeding records, milk production records

         **(NOTE: The accompanying software for this unit includes a program for lamb yield grade.)**

      3. Calculating budgets and break-even prices

      4. Recording and analyzing financial records

      5. Marketing plans and/or schedules

      6. Feed rations and nutritional planning

      7. Livestock management

      8. Cattle selection

         **(NOTE: The accompanying software for this unit includes a program for dairy cow purchase analysis.)**

## INFORMATION SHEET

9. Break-even feeder calf analysis
10. Inventory control
11. Livestock loss records

B. Equipment operation

1. Controlling automated feeding systems
2. Controlling poultry and swine houses

   (NOTE: These could include ventilation, water and feeding systems, and waste systems.)

3. Controlling automatic milking systems
4. Analyzing the equipment purchase
5. Depreciation schedules

V. Sources of microcomputer software for animal science (Transparency 2; Assignment Sheet #1)

A. Commercial vendors

B. College of Agriculture departments

C. Extension service

D. Computer user groups

E. Agricultural magazines/newsletters

F. Custom software

(NOTE: This is software which is developed for a specific use or purpose.)

G. Personal programming

(NOTE: By learning and using basic programming skills, an individual can develop new programs or adapt custom software to fit specific needs.)

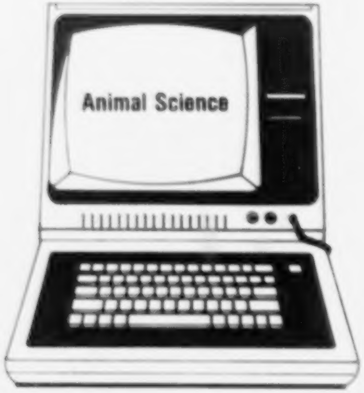
H. Time-sharing systems

Examples: AGNET, CMNET, OASIS, SOURCE

I. Breed associations

# People Who Use the Microcomputer in Animal Science Applications

Representatives of Breed Associations



Veterinarians

Vo-Ag Instructors

Extension Agents

Feed Dealers and Manufacturers

University Researchers

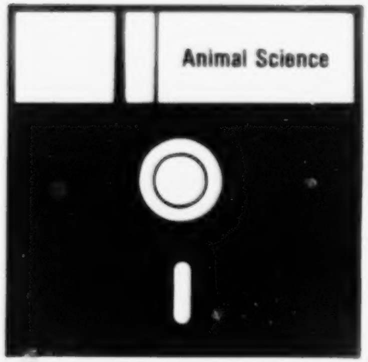
Farmers and Ranchers

Consultants from Marketing News Services

Farm and Ranch Managers

# Sources of Microcomputer Software (Animal Science)

College of Agriculture Departments



Commercial Vendors

Computer User Groups

Custom Software

Extension Service

Personal Programming

Breed Associations

Agricultural Magazines/Newsletters

Time-Sharing Systems

# MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE
## UNIT V

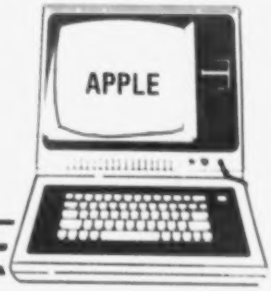
## ASSIGNMENT SHEET #1 — DETERMINE SPECIFIC SOURCES OF ANIMAL SCIENCE SOFTWARE

**Directions:** Determine specific sources of animal science software which are readily available in your area. Be specific with information which will help you in obtaining the actual software when its use becomes necessary. Use the form provided on the back of this page to complete the assignment.

## ASSIGNMENT SHEET #1

| SOURCES OF SOFTWARE (Company name, address, phone, and contact person) | NAME OF PROGRAM | HARDWARE REQUIRED | PURPOSE OF SOFTWARE | COST | FEATURES |
|---|---|---|---|---|---|
| | | | | | |

# MICROCOMPUTER APPLICATIONS IN
# ANIMAL SCIENCE
# UNIT V



## JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO ANIMAL SCIENCE (LAMB YIELD GRADE)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Insert the diskette in Disk Drive 1

  B. Close the disk drive door

  C. Turn on the computer

  (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

  D. Type the number [8] designating the "Lamb Yield Grade" program and press [RETURN]

  E. Follow the procedures outlined in the program

  F. Complete the following problems

## JOB SHEET #1

PROBLEM #1: Determine the yield grades for the following lamb carcasses.

| ID NUMBER | LEG * CONFORMATION SCORE | PERCENT KIDNEY AND PELVIC FAT | FAT THICKNESS OVER THE RIB EYE | YIELD GRADE |
|---|---|---|---|---|
| #11 | 14 | 4.5% | .40" | |
| #39 | 12 | 1.5% | .05" | |
| #24 | 10 | 2.5% | .10" | |
| #31 | 9 | 1.9% | .10" | |

*Remember leg conformation scores range from 15 to 1 and correspond to quality grades of the lamb carcass. Example: High prime = 15; average prime = 14; high choice = 12; low choice = 10

PROBLEM #2: Determine the yield grade for the following lamb carcasses.

| ID NUMBER | LEG * CONFORMATION SCORE | PERCENT KIDNEY AND PELVIC FAT | FAT THICKNESS OVER THE RIB EYE | YIELD GRADE |
|---|---|---|---|---|
| #09 | 12 | 3.4% | .25" | |
| #28 | 14 | 3.8% | .30" | |
| #46 | 8 | 2.3% | .15" | |

PROBLEM #3: Using information from your own farming program or from an example given to you by your instructor, calculate the yield grade on other lamb carcasses. Use accurate information from actual farm records for your inputs if possible

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE
## UNIT V

RADIO
SHACK

### JOB SHEET #1 — RUN AN APPLICATION [illegible]OGRAM RELATED TO ANIMAL SCIENCE (LAMB YI[illegible] GRADE)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #1

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [8] designating the "Lamb Yield Grade" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

PROBLEM #1: Determine the yield grades for the following lamb carcasses.

| ID NUMBER | LEG * CONFORMATION SCORE | PERCENT KIDNEY AND PELVIC FAT | FAT THICKNESS OVER THE RIB EYE | YIELD GRADE |
|---|---|---|---|---|
| #11 | 14 | 4.5% | .40" | ________ |
| #39 | 12 | 1.5% | .05" | ________ |
| #24 | 10 | 2.5% | .10" | ________ |
| #31 | 9 | 1.9% | .10" | ________ |

*Remember leg conformation scores range from 15 to 1 and correspond to quality grades of the lamb carcass. Example: High prime = 15; average prime = 14; high choice = 12; low choice = 10; etc.

PROBLEM #2: Determine the yield grade for the following lamb carcasses.

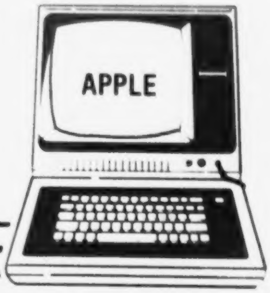
| ID NUMBER | LEG * CONFORMATION SCORE | PERCENT KIDNEY AND PELVIC FAT | FAT THICKNESS OVER THE RIB EYE | YIELD GRADE |
|---|---|---|---|---|
| #09 | 12 | 3.4% | .25" | ________ |
| #28 | 14 | 3.8% | .30" | ________ |
| #46 | 8 | 2.3% | .15" | ________ |

## JOB SHEET #1

PROBLEM #3: Using information from your own farming program or from an example given to you by your instructor, calculate the yield grade on other lamb carcasses. Use accurate information from actual farm records for your inputs if possible

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE
## UNIT V



## JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO ANIMAL SCIENCE (DAIRY COW PURCHASE ANALYSIS)

I. Equipment and materials needed

   A. Microcomputer

      (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

   B. Accompanying software

      (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Insert the diskette in Disk Drive 1

   B. Close the disk drive door

   C. Turn on the computer

      (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

   D. Type the number [9] designating the "Dairy Cow Purchase Analysis" program and press [RETURN]

   E. Follow the procedures outlined in the program

   F. Complete the following problems

## JOB SHEET #2

PROBLEM #1: Determine the value of a dairy cow and the length of time in which she will pay for herself under the following conditions.

1. The annual milk production is 16500 lbs.
2. The price of milk is 13.75/cwt.
3. The value of the calf will be $125.00.
4. The useful life of the cow is 5 yrs.
5. The estimated cull value is $500.00
6. Interest on your money is 14.5%.

USING THESE FIGURES, CALCULATE THE FOLLOWING:

A. How much is the cow worth? ____________________

B. How long will it take for the cow to pay for herself? ____________________

C. What is the payback period for springers? ____________________

PROBLEM #2: Using the same information from problem one, what is the new value of the dairy cow and the anticipated payback period under the following conditions?

(NOTE: You will need to go back to the input table and enter new information.)

A. The cost of milk decreases to $11.75/cwt.

Value of cow = __________
Payback period = __________

B. The price of milk is $13.75 and milk production decreases to 12000 lbs.

Value of cow = __________
Payback period = __________

C. Milk production is 16500 lbs. and the interest rate of loan decreases to 13%.

Value of cow = __________
Payback period = __________

PROBLEM #3: Using information from your own farming program or from an example given to you by your instructor, calculate the value of a dairy cow and the payback period. Use accurate information from the latest dairy markets for your inputs.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN
# ANIMAL SCIENCE
## UNIT V

RADIO
SHACK

### JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO ANIMAL SCIENCE (DAIRY COW PURCHASE ANALYSIS)

I. Equipment and materials needed

   A. Microcomputer

   (NOTE: This job sheet has been designed to be used with either Radio Shack, Model III or IV microcomputer.)

   B. Accompanying software

   (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Turn the computer on

   (NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

   B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

   **(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

   C. Close the disk drive door

   D. Press the [RESET] button

   (NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

   E. Enter the date and press [ENTER]

   Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #2

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [9] designating the "Dairy Cow Purchase Analysis" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

PROBLEM #1: Determine the value of a dairy cow and the length of time in which she will pay for herself under the following conditions.

1. The annual milk production is 16500 lbs.
2. The price of milk is 13.75/cwt.
3. The value of the calf will be $125.00.
4. The useful life of the cow is 5 yrs.
5. The estimated cull value is $500.00
6. Interest on your money is 14.5%.

USING THESE FIGURES, CALCULATE THE FOLLOWING:

A. How much is the cow worth? ____________________

B. How long will it take for the cow to pay for herself? ____________________

C. What is the payback period for springers? ____________________

PROBLEM #2: Using the same information from problem one, what is the new value of the dairy cow and the anticipated payback period under the following conditions?

(NOTE: You will need to go back to the input table and enter new information.)

A. The cost of milk decreases to $11.75/cwt.

Value of cow = __________
Payback period = __________

## JOB SHEET #2

B. The price of milk is $13.75 and milk production decreases to 12000 lbs.

Value of cow = __________
Payback period = __________

C. Milk production is 16500 lbs. and the interest rate of loan decreases to 13%.

Value of cow = __________
Payback period = __________

**PROBLEM #3:** Using information from your own farming program or from an example given to you by your instructor, calculate the value of a dairy cow and the payback period. Use accurate information from the latest dairy markets for your inputs.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE
## UNIT V

## ANSWERS TO JOB SHEET PROBLEMS

### JOB SHEET #1

Problem #1

| ID NUMBER | YIELD GRADE |
|---|---|
| #11 | **4.75** |
| #39 | **1.77** |
| #24 | **2.45** |
| #31 | **2.35** |

Problem #2

| ID NUMBER | YIELD GRADE |
|---|---|
| #09 | **3.58** |
| #28 | **3.91** |
| #46 | **2.83** |

Problem #3 — Performance skills evaluated to the satisfaction of the instructor

### JOB SHEET #2

Problem #1

a. 2812.86
b. 36.5 months
c. 16.5

Problem #2

a. Value of cow = **1700**
Payback period = **29.6 months**

b. Value of cow = **727.56**
Payback period = **18.2 months**

c. Value of cow = **2812.86**
Payback period = **35.6 months**

Problem #3 — Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN
# ANIMAL SCIENCE
# UNIT V

NAME ________________________

## TEST

1. Complete the following list of types of livestock for which programs might be developed.

   a. Beef

   b. Dairy goats

   c. Horses

   d. Fish

   e. ______________________________________________

   f. ______________________________________________

   g. ______________________________________________

   h. ______________________________________________

2. Select people who use the microcomputer for animal science applications by placing an "X" in the appropriate blanks.

   _____a. University researchers

   _____b. Fertilizer dealers

   _____c. Truckers

   _____d. Veterinarians

   _____e. Farmers and ranchers

   _____f. Feed dealers and manufacturers

   _____g. Insurance agents

   _____h. Consultants from marketing news services

   _____i. Extension agents

   _____j. Representatives of breed associations

   _____k. Vocational agriculture instructors

## TEST

3. Circle the words which best complete the reasons for using a microcomputer in animal science.

   a. To document (production, financial) information

   b. To keep accurate (records, statements)

   c. To help make (marketing, credit) decisions

4. List six examples of software which might be used in animal science.

   a. ______________________________

   b. ______________________________

   c. ______________________________

   d. ______________________________

   e. ______________________________

   f. ______________________________

5. Select sources of microcomputer software for animal science by placing an "X" in the appropriate blanks.

   _____a. Supervisors

   _____b. Time-sharing systems

   _____c. Custom software

   _____d. Department stores

   _____e. Commercial vendors

   _____f. Extension service

   _____g. Computer user groups

   _____h. Agricultural magazines/newsletters

   _____i. Personal programming

   _____j. College of Agriculture departments

   _____k. Breed associations

# TEST

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

6. Determine specific sources of animal science software.

7. Demonstrate the ability to:

    a. Run an application program related to animal science (lamb yield grade).

    b. Run an application program related to animal science (dairy cow purchase analysis).

# MICROCOMPUTER APPLICATIONS IN ANIMAL SCIENCE
## UNIT V

## ANSWERS TO TEST

1. Any four of the following:
   - a. Dairy cattle
   - b. Sheep
   - c. Swine
   - d. Rabbits
   - e. Fur-bearing animals
   - f. Poultry

2. a, d, e, f, h, i, j, k

3. a. Financial
   - b. Records
   - c. Marketing

4. Any six of the following or ones discussed in class:
   - a. Formulating and analyzing rations
   - b. Recording and analyzing production records
   - c. Calculating budgets and break-even prices
   - d. Recording and analyzing financial records
   - e. Controlling automated feeding systems
   - f. Controlling poultry and swine houses
   - g. Controlling automatic milking systems
   - h. Analyzing the equipment purchase
   - i. Depreciation schedules
   - j. Marketing plans and/or schedules
   - k. Feed rations and nutritional planning
   - l. Livestock management

5. b, c, e, f, g, h, i, j, k

6. Evaluated to the satisfaction of the instructor

7. Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN CROP SCIENCE

## UNIT OBJECTIVE

After completion of this unit, the student should be able to select people who use the microcomputer in crop science applications, determine appropriate software for use in crop science, and run application programs. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment and job sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Complete a list of types of crops for which programs might be developed.
2. Select people who use the microcomputer in crop science applications.
3. Select true statements concerning the reasons for using a microcomputer in crop science.
4. List examples of software which might be used in crop science.
5. Select sources of microcomputer software for crop science.
6. Determine specific sources of crop science software.
7. Demonstrate the ability to:
    a. Run an application program related to crop science (crop comparison).
    b. Run an application program related to crop science (grain bin capacity analysis).

# MICROCOMPUTER APPLICATIONS IN
# CROP SCIENCE
# UNIT VI

## SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information, assignment, and job sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Provide resources for use by the students when completing Assignment Sheet #1.

VI. Demonstrate and discuss procedures outlined in the job sheets.

VII. Provide access to computer for practice in running the application programs.

VIII. Use advanced students as group leaders to work with students in running programs.

IX. Invite an agricultural economist or extension agent from a local university to demonstrate software developed for crop science applications.

X. Invite a local farmer, agribusiness person, and/or integrated pest management expert who uses a microcomputer in making decisions relevant to crops to talk to the class on the advantages of using the computer.

XI. Provide examples of some of the types of reports that can be received by using a microcomputer in the crop science area.

XII. Lead a classroom discussion on ways a microcomputer could be used in the area of crops. Have students add at least ten new ways to the list already provided in the information sheet.

XIII. Provide each student with adequate time to complete the accompanying software.

XIV. Have students run other software programs which are applicable to crop science.

(NOTE: See resource list which is included in introductory material.)

XV. Give test.

XVI. Reteach if necessary.

XVII. Provide additional practice time if needed.

## INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Transparency masters

    1. TM 1 — People Who Use the Microcomputer in Crop Science Applications

    2. TM 2 — Sources of Microcomputer Software (Crop Science)

  D. Assignment Sheet #1 — Determine Specific Sources of Crop Science Software

  E. Job sheets

    1. Job Sheet #1 — Run an Application Program Related to Crop Science (Crop Comparison)

    2. Job Sheet #2 — Run an Application Program Related to Crop Science (Grain Bin Capacity Analysis)

  F. Test

  G. Answers to test

II. Suggested materials:

  A. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984

  B. Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.

  C. Beasley, Jack O. *Microcomputers on the Farm.* Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

  D. *Agricultural Computing Source Book.* St. Louis, MO: Doane Western, Inc., 1984.

  E. Agri-Education, Inc., 815 Shakespeare, Stratford, IA 50249.

  (NOTE: Agri-Education, Inc., is a software distributor of agricultural computer programs designed for educational purposes. The following programs are available in crop science.)

    1. Farm Drainage

## INSTRUCTIONAL MATERIALS

2. Aglime
3. Conservation Tillage
4. Herbicide Selection
5. Insecticide Selection

F. Microcomputer Programs in Agriculture. Vocational Agriculture Science, University of Illinois, 1401 S. Maryland Drive, Urbana, IL 61801.

(NOTE: The following programs are designed to run on the Commodore Pet, Apple II Plus, and Radio Shack TRS-80 Model III machines.)

1. Fertilizer Cost
2. Crop Budget
3. Soil Loss Equation
4. Nitrogen Program

# MICROCOMPUTER APPLICATIONS IN
# CROP SCIENCE
## UNIT VI

## INFORMATION SHEET

I. Types of crops for which programs might be developed

  A. Forage

  B. Grasses

  C. Grains

    Examples: Wheat, corn, oats, barley

  D. Fibers

    Examples: Cotton, flax

  E. Roots

    Example: Potatoes

  F. Tobacco

  G. Legumes

    Examples: Peas, beans

  H. Truck crops

    Examples: Lettuce, melons

II. People who use the microcomputer in crop science applications (Transparency 1)

  A. Farmers and ranchers

  B. Farm and ranch managers

  C. Vocational agriculture instructors

  D. Seed dealers

  E. Fertilizer dealers

  F. Pesticide dealers

  G. Equipment dealers

  H. Fuel and oil dealers

  I. Grain storage personnel

## INFORMATION SHEET

J. Markets and marketing news personnel

K. Extension agents

L. University researchers

M. Agricultural consultants

III. Reasons for using a microcomputer in crop science

A. To determine the profitability of the crops being grown

(NOTE: In addition to helping to determine which crops are the most profitable, the financial reports can help with the processing of income tax records and help to verify information needed to establish credit and/or make investments.)

B. To help make decisions regarding crops management

(NOTE: This could include areas such as the selection of crops, varieties to plant, fertilizers and/or insecticides to use, harvesting procedures, equipment needed, and marketing procedures.)

IV. Examples of software which might be used in crop science

A. Records and analysis

1. Keeping crop production records

2. Comparing the economics of raising one crop rather than another

**(NOTE: The accompanying software for this unit includes a program for crop comparison analysis.)**

3. Keeping crop financial records

4. Aiding in crop operational and financial planning

5. Providing market news and futures prices

6. Calculating plant populations

7. Providing weather analysis and predictions

8. Calculating crop yields

9. Calculating harvest losses

10. Analysis of soil test reports

## INFORMATION SHEET

B. Equipment

  1. Calibrating equipment and calculating rates

    a. Calculating seed rates

    b. Calculating fertilizer rates

    c. Calculating pesticide rates

    d. Calculating grain bin capacity

**(NOTE: The accompanying software for this unit includes a program for calculating grain bin capacity.)**

  2. Operation and control

    a. Digital controlled and monitored operations on tractors, combines, and other equipment

    b. Calculating correct weight placement, tire size, and load for proper traction

    c. Controlling grain handling equipment and dryers

    d. Controlling forage handling and storing systems

    e. Controlling irrigation systems

C. Production techniques

  1. Keeping fertilizer records

  2. Determining chemical usage

  3. Aiding in integrated pest management

  4. Planning irrigation schedules

V. Sources of microcomputer software (Transparency 2; Assignment Sheet #1)

  A. Commercial vendors

  B. College of Agriculture departments

  C. Extension service

  D. Computer user groups

## INFORMATION SHEET

E. Agricultural magazines/newsletters

F. Custom software

(NOTE: This is software which is developed for a specific use or purpose.)

G. Personal programming

(NOTE: By learning and using basic programming skills, an individual can develop new programs or adapt custom software to fit specific needs.)

H. Time-sharing systems

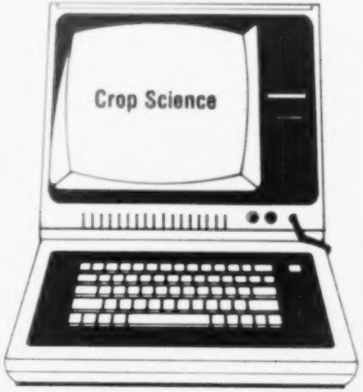
Examples: AGNET, CMNET, OASIS, SOURCE

# People Who Use the Microcomputer in Crop Science Applications

Market and Marketing News Personnel

Farmers and Ranchers

Farm and Ranch Managers



Extension Agents

Vo-Ag Instructors

Fertilizer Dealers

Chemical Dealers

Fuel and Oil Dealers

Equipment Dealers

University Researchers

Grain Storage Personnel

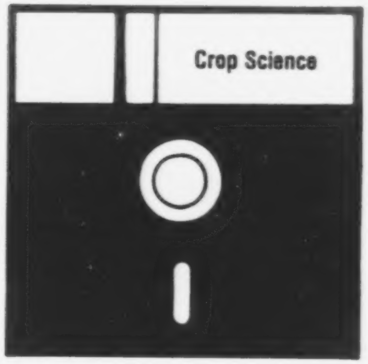
Agricultural Consultants

# Sources of Microcomputer Software
# (Crop Science)

College of Agriculture Departments

Commercial Vendors

Computer User Groups



Custom Software

Extension Service

Personal Programming

Time-Sharing Systems

Agricultural Magazines/Newsletters

# MICROCOMPUTER APPLICATIONS IN
# CROP SCIENCE
## UNIT VI

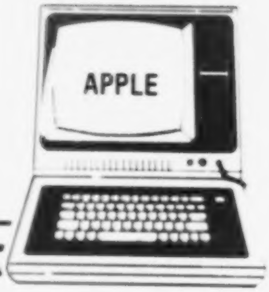
## ASSIGNMENT SHEET #1 — DETERMINE SPECIFIC SOURCES OF CROP SCIENCE SOFTWARE

Directions: Determine specific sources of crop science software which are readily available in your area. Be specific with information which will help you in obtaining the actual software when its use becomes necessary. Use the form provided on the back of this page to complete the assignment.

ASSIGNMENT SHEET #1

| SOURCES OF SOFTWARE (Company name, address, phone, and contact person) | NAME OF PROGRAM | HARDWARE REQUIRED | PURPOSE OF SOFTWARE | COST | FEATURES |
|---|---|---|---|---|---|
| | | | | | |

# MICROCOMPUTER APPLICATIONS IN CROP SCIENCE
# UNIT VI



## JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO CROP SCIENCE (CROP COMPARISON)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Insert the diskette in Disk Drive 1

B. Close the disk drive door

C. Turn on the computer

(NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

D. Type the number [10] designating the "Crop Comparison" program and press [RETURN]

E. Follow the procedures outlined in the program

F. Complete the following problems

(NOTE: When running this program you will be given the options of outputting to the screen or outputting to a printer. For purposes of this job sheet, press [1] to output to the screen.)

## JOB SHEET #1

PROBLEM #1: Determine the most profitable crop to raise when given a choice of two crops.

Name of base crop — Corn
Unit of yield — Bushel
Expected corn yield/acre — 105
Expected corn price/bushel — $3.10
Direct expense/acre for corn
(Less secondary crop value) — $158

Name of competing crop — Soybeans
Unit of yield — Bushel
Expected yield for soybeans — 35
Expected soybean price/bushel — $7.85
Direct expense/acre for soybeans
(Less secondary crop value) — $85

TABLE 1 — CORN YIELD/ACRE = 105 BUSHELS

If the price of corn is $3.10, what would be the required production of soybeans at the prices listed below to equal the profit derived from corn

SOYBEAN PRICES

| | $7.46 | $7.65 | $7.85 | $8.05 | $8.24 |
|---|---|---|---|---|---|
| Soybean Yield | ______ | ______ | ______ | ______ | ______ |

Based on this information, which crop would be the most profitable?_________

TABLE 2 — CORN PRICE/BUSHEL = $3.10

If the yield of corn is 105, what would be the required price per bushel of soybeans at the yields listed below to equal the profit derived from corn?

SOYBEAN YIELDS

| | 28 | 31.5 | 35 | 38.5 | 42 |
|---|---|---|---|---|---|
| Soybean Price/Bu. | ______ | ______ | ______ | ______ | ______ |

Based on this information, which crop would be most profitable?____________

## JOB SHEET #1

### TABLE 3 — CORN RETURN PER ACRE

What is the return per acre at the following corn prices and yields?

| PRICE | YIELD | RETURN |
|---|---|---|
| $2.94 | 84 | ________ |
| $3.02 | 94.5 | ________ |
| $3.10 | 105 | ________ |
| $3.18 | 115.5 | ________ |
| $3.26 | 126 | ________ |

**PROBLEM #2:** Using information from the farm or an example given to you by your instructor, compare the profitability of crops which might be grown in your area.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN CROP SCIENCE
## UNIT VI

RADIO
SHACK

### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO CROP SCIENCE (CROP COMPARISON)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Turn the computer on

  (NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

  B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

  **(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

  C. Close the disk drive door

  D. Press the [RESET] button

  (NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

  E. Enter the date and press [ENTER]

  Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #1

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [10] designating the "Crop Comparison" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

(NOTE: When running this program you will be given the options of outputting to the screen or outputting to a printer. For purposes of this job sheet, press [1] to output to the screen.)

PROBLEM #1: Determine the most profitable crop to raise when given a choice of two crops.

Name of base crop — Corn
Unit of yield — Bushel
Expected corn yield/acre — 105
Expected corn price/bushel — $3.10
Direct expense/acre for corn
(Less secondary crop value) — $158

Name of competing crop — Soybeans
Unit of yield — Bushel
Expected yield for soybeans — 35
Expected soybean price/bushel — $7.85
Direct expense/acre for soybeans
(Less secondary crop value) — $85

## JOB SHEET #1

### TABLE 1 — CORN YIELD/ACRE = 105 BUSHELS

If the price of corn is $3.10, what would be the required production of soybeans at the prices listed below to equal the profit derived from corn

SOYBEAN PRICES

| | $7.46 | $7.65 | $7.85 | $8.05 | $8.24 |
|---|---|---|---|---|---|
| Soybean Yield | ______ | ______ | ______ | ______ | ______ |

Based on this information, which crop would be the most profitable?_________

### TABLE 2 — CORN PRICE/BUSHEL = $3.10

If the yield of corn is 105, what would be the required price per bushel of soybeans at the yields listed below to equal the profit derived from corn?

SOYBEAN YIELDS

| | 28 | 31.5 | 35 | 38.5 | 42 |
|---|---|---|---|---|---|
| Soybean Price/Bu. | ______ | ______ | ______ | ______ | ______ |

Based on this information, which crop would be most profitable?____________

### TABLE 3 — CORN RETURN PER ACRE

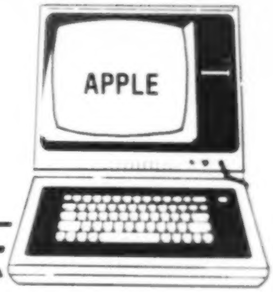
What is the return per acre at the following corn prices and yields?

| PRICE | YIELD | RETURN |
|---|---|---|
| $2.94 | 84 | __________ |
| $3.02 | 94.5 | __________ |
| $3.10 | 105 | __________ |
| $3.18 | 115.5 | __________ |
| $3.26 | 126 | __________ |

PROBLEM #2: Using information from the farm or an example given to you by your instructor, compare the profitability of crops which might be grown in your area.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN CROP SCIENCE
## UNIT VI



### JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO CROP SCIENCE (GRAIN BIN CAPACITY ANALYSIS)

I. Equipment and materials needed

   A. Microcomputer

      (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

   B. Accompanying software

      (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Insert the diskette in Disk Drive 1

   B. Close the disk drive door

   C. Turn on the computer

      (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

   D. Type the number [11] designating the "Grain Bin Capacity Analysis" program and press [RETURN]

   E. Follow the procedures outlined in the program

   F. Complete the following problems

## JOB SHEET #2

PROBLEM #1: Use the following information to calculate the capacity of a grain bin.

1. Bin is rectangular
2. Length in feet — 40
3. Width in feet — 24
4. Height in feet — 10
5. Used for storing corn

### RECTANGULAR BIN CALCULATION

A full bin will hold:

Approximate bushels ____________

Pounds per bushel ____________

Total pounds ____________

Total tons ____________

PROBLEM #2: Use the following information to calculate the capacity of a grain bin.

1. Bin is round
2. Diameter in feet — 30
3. Height in feet — 20
4. Used for storing wheat

### ROUND BIN CALCULATION

A full bin will hold:

Approximate bushels ____________

Pounds per bushel ____________

Total pounds ____________

Total tons ____________

PROBLEM #3: Using information from your home or farm or from an example given to you by your instructor, calculate the capacity of a grain bin.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN CROP SCIENCE
## UNIT VI

RADIO
SHACK

## JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO CROP SCIENCE (GRAIN BIN CAPACITY ANALYSIS)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #2

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [11] designating the "Grain Bin Capacity Analysis" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

PROBLEM #1: Use the following information to calculate the capacity of a grain bin.

1. Bin is rectangular
2. Length in feet — 40
3. Width in feet — 24
4. Height in feet — 10
5. Used for storing corn

RECTANGULAR BIN CALCULATION

A full bin will hold:

Approximate bushels ____________

Pounds per bushel ____________

Total pounds ____________

Total tons ____________

PROBLEM #2: Use the following information to calculate the capacity of a grain bin.

1. Bin is round
2. Diameter in feet — 30
3. Height in feet — 20
4. Used for storing wheat

## JOB SHEET #2

### ROUND BIN CALCULATION

A full bin will hold:

Approximate bushels ________

Pounds per bushel ________

Total pounds ________

Total tons ________

PROBLEM #3: Using information from your home or farm or from an example given to you by your instructor, calculate the capacity of a grain bin.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN CROP SCIENCE
## UNIT VI

## ANSWERS TO JOB SHEET PROBLEMS

JOB SHEET #1

Problem #1

**Table 1**

| | | | | | |
|---|---|---|---|---|---|
| Soybean Yield | 34.26 | 33.41 | 32.56 | 31.75 | 31.01 |

Soybeans would be most profitable

**Table 2**

| | | | | | |
|---|---|---|---|---|---|
| Soybean Price/Bu. | 9.12 | 8.11 | 7.3 | 6.63 | 6.08 |

Corn would be most profitable

**Table 3**

| RETURN |
|---|
| 102.39 |
| 134.94 |
| 167.50 |
| 200.04 |
| 232.60 |

Problem #2 — Performance skills evaluated to the satisfaction of the instructor

JOB SHEET #2

Problem #1

RECTANGULAR BIN

| | |
|---|---|
| Approximate bushels | 7717 |
| Pounds per bushel | 56 |
| Total pounds | 432152 |
| Total tons | 216.076 |

## ANSWERS TO JOB SHEET PROBLEMS

Problem #2

### ROUND BIN

| | |
|---|---|
| Approximate bushels | 11359 |
| Pounds per bushel | 60 |
| Total pounds | 681540 |
| Total tons | 340.77 |

Problem #3 — Performance skills evaluated to the satisfaction of the instructor

MICROCOMPUTER APPLICATIONS IN
CROP SCIENCE
UNIT VI

NAME ______________________

TEST

1. Complete the following list of types of crops for which programs might be developed.

   a. Fibers

   b. Roots

   c. Tobacco

   d. ______________________

   e. ______________________

   f. ______________________

   g. Legumes

   h. Truck crops

2. Select people who use the microcomputer in crop science applications by placing an "X" in the appropriate blanks.

   _____a. Equipment dealers

   _____b. Pesticide dealers

   _____c. Seed dealers

   _____d. Extension agents

   _____e. Machinist

   _____f. Markets and marketing news personnel

   _____g. Vocational agriculture instructors

   _____h. Agricultural engineers

   _____i. Mechanics

   _____j. Grain storage personnel

   _____k. Seed dealers

   _____l. Extension home economists

## TEST

3. Select true statements concerning the reasons for using a microcomputer in crop science by placing an "X" in the appropriate blanks.

_____a. To determine the profitability of the equipment being used

_____b. To help make decisions regarding crops management

_____c. To determine the profitability of the crops being grown

4. List ten examples of software which might be used in crop science.

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

f. ______________________________

g. ______________________________

h. ______________________________

i. ______________________________

j. ______________________________

5. Select sources of microcomputer software for crop science by placing an "X" in the appropriate blanks.

_____a. Custom software

_____b. Extension service

_____c. Business departments

_____d. Schools

_____e. Commercial vendors

_____f. College of Agriculture departments

_____g. Agricultural magazines/newsletters

_____h. Implement dealers

TEST

_____i. Fertilizer dealers

_____j. Time-sharing systems

_____k. Computer user groups

_____l. Personal programming

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

6. Determine specific sources of crop science software.

7. Demonstrate the ability to:

   a. Run an application program related to crop science (crop comparison).

   b. Run an application program related to crop science (grain bin capacity analysis).

# MICROCOMPUTER APPLICATIONS IN CROP SCIENCE
## UNIT VI

## ANSWERS TO TEST

1. d. Forage
   e. Grasses
   f. Grains

2. a, b, c, d, f, g, j, k

3. b, c

4. Any ten of the following or ones discussed in class:

   a. Keeping crop production records
   b. Comparing the economics of raising one crop rather than another
   c. Keeping crop financial records
   d. Aiding in crop operational and financial planning
   e. Providing market news and futures prices
   f. Calculating plant populations
   g. Providing weather analysis and predictions
   h. Calculating crop yields
   i. Calculating harvest losses
   j. Analysis of soil test reports
   k. Calibrating equipment and calculating rates
   l. Calculating seed rates
   m. Calculating fertilizer rates
   n. Calculating pesticide rates
   o. Calculating grain bin capacity
   p. Digital controlled and monitored operations on tractors, combines, and other equipment
   q. Calculating correct weight placement, tire size, and load for proper traction
   r. Controlling grain handling equipment and dryers
   s. Controlling forage handling and storing systems
   t. Controlling irrigation systems
   u. Keeping fertilizer records
   v. Determining chemical usage
   w. Aiding in integrated pest management
   x. Providing irrigation schedules

5. a, b, e, f, g, j, k, l

6. Evaluated to the satisfaction of the instructor

7. Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE

## UNIT OBJECTIVE

After completion of this unit, the student should be able to select people who use the microcomputer in horticulture applications, provide examples of software programs which might be used in horticulture, determine appropriate software for use in the area of horticulture, and run an application program. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment and job sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Complete a list of areas of horticulture for which programs might be developed.
2. Select people who use the microcomputer in horticulture applications.
3. Circle the words which best complete reasons for using a microcomputer in horticulture.
4. List examples of software programs which might be used in horticulture.
5. Select sources of microcomputer software for horticulture.
6. Determine specific sources of horticulture software.
7. Demonstrate the ability to run an application program related to horticulture (plant inventory).

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII

## SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information, assignment, and job sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Provide resources for use by the students when completing Assignment Sheet #1.

VI. Demonstrate and discuss procedures outlined in the job sheet.

VII. Provide access to computer for practice in running the application program.

VIII. Use advanced students as group leaders to work with other students in running programs.

IX. Discuss other sources of horticulture software which are not listed in the information sheet.

X. Invite a landscape architect or nursery manager who has used a microcomputer in planning various projects to class to discuss some of the advantages of using a computer to assist in the job.

XI. Provide each student with adequate time to complete the accompanying software.

XII. Have students run other software programs which are applicable to horticulture.

(NOTE: See resource list which is included in the introductory material.)

XIII. Give test.

XIV. Reteach if necessary.

XV. Provide additional practice time if needed.

## INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

## INSTRUCTIONAL MATERIALS

B. Information sheet

C. Transparency masters

1. TM 1 — People Who Use the Microcomputer in Horticulture Applications
2. TM 2 — Sources of Microcomputer Software (Horticulture)

D. Assignment Sheet #1 — Determine Specific Sources of Horticulture Software

E. Job Sheet #1 — Run an Application Program Related to Horticulture (Plant Inventory)

F. Test

G. Answers to test

II. References:

A. Denisen, Ervin L. *Principles of Horticulture.* New York: MacMillan Publishing Co., Inc., 1979.

B. Richardson, William B. and Gary E. Moore. *Working in Horticulture.* New York: Gregg Division, McGraw-Hill Book Co., 1980.

III. Additional materials:

A. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984.

B. Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.

C. Beasley, Jack O. *Microcomputers on the Farm.* Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

D. *Agricultural Computing Source Book.* St. Louis, MO: Doane Western, Inc., 1984.

E. Microcomputer Programs in Agriculture. Vocational Agriculture Service, University of Illinois, 1401 S. Maryland Drive, Urbana, IL 61801

(NOTE: The following programs are designed to run on the Commodore Pet, Apple II Plus, and Radio Shack TRS-80 Model III machines.)

1. Greenhouse Heating and Cooling
2. Fertilizer Cost
3. Soil Loss Equation

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII

## INFORMATION SHEET

I. Areas of horticulture for which programs might be developed

   A. Turf, landscaping, and nursery production

   B. Fruit production

   C. Vegetable production

   D. Tree and shrub cultivation

II. People who use the microcomputer in horticulture applications (Transparency 1)

   (NOTE: The following list includes some of the horticulture jobs where a microcomputer could be of assistance.)

   A. Nursery workers and supervisors

   B. Greenhouse employees

      (NOTE: This could include growers and workers, technicians, and managers.)

   C. Florists

   D. Floral designers

   E. Landscape design architects

   F. Landscape maintenance workers

   G. Quality control technicians

   H. Horticulture salespeople

   I. Garden center managers and employees

   J. Farmers and farm managers

   K. University researchers

   L. Vocational horticulture instructors

## INFORMATION SHEET

III. Reasons for using a microcomputer in horticulture

A. To determine the profitability of the items being grown and marketed

(NOTE: In addition to helping to determine which plants are the most profitable, the financial reports can help with the processing of income tax records and help to verify information needed to establish credit and/or make investments.)

B. To help make management decisions

(NOTE: This could include areas such as the selection of plants/seeds, varieties to plant, fertilizing and/or application of insecticides, equipment needed, and marketing procedures.)

C. To regulate environmental conditions

IV. Examples of software programs which might be used in horticulture

(NOTE: Research has shown that there are currently very few programs which have been developed for the area of horticulture. However, many possibilities are evident. Some of these are listed below.)

A. Soil management practices

Examples: Fertilizing, liming, cultivation, rotation, intercropping, mulching, and soil conservation methods

B. Irrigation

Examples: Frequency schedules, amounts, types of systems to use

C. Light, ventilation, and temperature management

D. Equipment

Examples: Purchase versus lease agreement, depreciation schedules, maintenance schedules, efficiency comparisons

E. Conditions for germination of seeds

F. Seed treatment, rate, depth, and spacing of seeds

G. Chemical application

H. Pruning schedules

I. Landscape schedules

INFORMATION SHEET

J. Landscape design

K. Cross-referencing

L. Specifications for jobs

M. Marketing procedures

N. Profit and loss statements

O Budgets and estimating

P. Cost and growth analysis

Q. Inventory control

**(NOTE: The accompanying software for this unit includes a program for plant inventory.)**

V. Sources of microcomputer software for horticulture (Transparency 2; Assignment Sheet #1)

(NOTE: As was explained in the NOTE under item IV, there are relatively few software packages which have been developed for the area of horticulture. However, it is anticipated that this area will gradually increase in the number of programs available. The following sources should be considered for this development.)

A. Commercial vendors

B. College of Agriculture departments

C. Extension service

D. Personal programming

(NOTE: By using basic programming skills, an individual can adapt existing programs such as those developed for the areas of crop science or equipment utilization for use in the area of horticulture.)

E. Agricultural magazines/newsletters

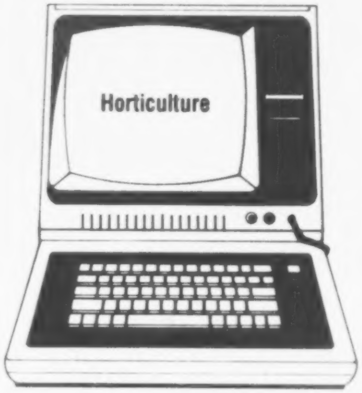
F. Manufacturers of buildings and equipment

# People Who Use the Microcomputer in Horticulture Applications

Nursery Workers and Supervisors

Florists

Floral Designers



Landscape Design Architects

Greenhouse Employees

Landscape Maintenance Workers

Farmers and Farm Managers

Horticulture Salespeople

Quality Control Technicians

Vocational Horticulture Instructors

Garden Center Managers and Employees

University Researchers

# Sources of Microcomputer Software (Horticulture)

Agricultural Magazines/Newsletters

Horticulture

Commercial Vendors

Extension Service

College of Agriculture Departments

Personal Programming

Manufacturers of Buildings and Equipment

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII

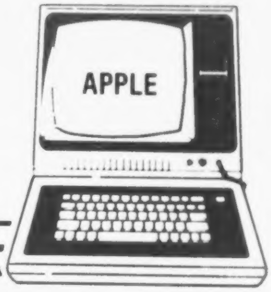
## ASSIGNMENT SHEET #1 — DETERMINE SPECIFIC SOURCES OF HORTICULTURE SOFTWARE

Directions: Determine specific sources of horticulture software which are readily available in your area. Be specific with information which will help you in obtaining the actual software when its use becomes necessary. Use the form provided on the back of this page to complete the assignment.

## ASSIGNMENT SHEET #1

| SOURCES OF SOFTWARE (Company name, address, phone, and contact person) | NAME OF PROGRAM | HARDWARE REQUIRED | PURPOSE OF SOFTWARE | COST | FEATURES |
|---|---|---|---|---|---|
| | | | | | |

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII



### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO HORTICULTURE (PLANT INVENTORY)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet had been designed to be used with any of the APPLE II compatible models.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Insert the diskette in Disk Drive 1

  B. Close the disk drive door

  C. Turn on the computer

  (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

  D. Type the number [12] designating the "Plant Inventory" program and press [RETURN]

  E. Follow the procedures outlined in the program

  F. Complete the following problems

## JOB SHEET #1

Problem #1: Determine plant inventory by entering quantities of plants purchased and sold.

(NOTE: Plant stock will be listed by plant number, plant, and quantity.)

Add the following plants to inventory:

| | |
|---|---|
| 10 | ACER |
| 6 | CORNUS |
| 19 | PICEA |
| 6 | QUERCUS |

Subtract the following plants:

| | |
|---|---|
| 15 | BERBERIS |
| 6 | EUONYMOUS |
| 10 | PICEA |
| 11 | SPIREA |

Complete the following inventory sheet based on the information above.

| NUMBER | PLANT | QUANTITY |
|---|---|---|
| 1 | ACER | |
| 2 | ARONIA | |
| 3 | BERBERIS | |
| 4 | CORNUS | |
| 5 | EUONYMOUS | |
| 6 | ILEX | |
| 7 | JUNIPERUS | |
| 8 | PICERA | |
| 9 | PINUS | |
| 10 | QUERCUS | |
| 11 | SPIREA | |
| 12 | VIBURNUM | |

Problem #2: Make your own inventory using information provided by your instructor.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII

RADIO
SHACK

### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO HORTICULTURE (PLANT INVENTORY)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet had been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Turn the computer on

  (NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

  B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

  **(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

  C. Close the disk drive door

  D. Press the [RESET] button

  (NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

  E. Enter the date and press [ENTER]

  Example: May 5, 1985 would be written as 05/05/85

## JOB SHEET #1

F. Enter the time or, if you wish to bypass this step, press [ENTER]

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [12] designating the "Plant Inventory" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

Problem #1: Determine plant inventory by entering quantities of plants purchased and sold.

(NOTE: Plant stock will be listed by plant number, plant, and quantity.)

Add the following plants to inventory:

| | |
|---|---|
| 10 | ACER |
| 6 | CORNUS |
| 19 | PICEA |
| 6 | QUERCUS |

Subtract the following plants:

| | |
|---|---|
| 15 | BERBERIS |
| 6 | EUONYMOUS |
| 10 | PICEA |
| 11 | SPIREA |

## JOB SHEET #1

Complete the following inventory sheet based on the information above.

| NUMBER | PLANT | QUANTITY |
|---|---|---|
| 1 | ACER | |
| 2 | ARONIA | |
| 3 | BERBERIS | |
| 4 | CORNUS | |
| 5 | EUONYMOUS | |
| 6 | ILEX | |
| 7 | JUNIPERUS | |
| 8 | PICERA | |
| 9 | PINUS | |
| 10 | QUERCUS | |
| 11 | SPIREA | |
| 12 | VIBURNUM | |

Problem #2: Make your own inventory using information provided by your instructor.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII

## ANSWERS TO JOB SHEET PROBLEMS

### JOB SHEET #1

Problem #1

| PLANT | QUANTITY |
|---|---|
| ACER | 25 |
| ARONIA | 21 |
| BERBERIS | 25 |
| CORNUS | 32 |
| EUONYMOUS | 26 |
| ILEX | 13 |
| JUNIPERUS | 12 |
| PICERA | 14 |
| PINUS | 10 |
| QUERCUS | 15 |
| SPIREA | 4 |
| VIBURNUM | 22 |

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII

NAME ______________________

## TEST

1. Complete the following list of areas of horticulture for which programs might be developed.

   a. Turf, landscaping, and nursery production

   b. Tree and shrub cultivation

   c. ______________________

   d. ______________________

2. Select people who use the microcomputer in horticulture applications by placing an "X" in the appropriate blanks.

   _____a. Quality control technicians

   _____b. Home economists

   _____c. Floral designers

   _____d. Nursery workers and supervisors

   _____e. Vocational horticulture instructors

   _____f. Farmers and farm managers

   _____g. Secretaries

   _____h. Garden center managers and employees

   _____i. University researchers

   _____j. Florists

   _____k. Landscape design architects

   _____l. Miners

   _____m. Hotel clerks

   _____n. Greenhouse employees

TEST

_____o. Landscape maintenance workers

_____p. Horticulture salespeople

_____q. Agronomists

3. Circle the words which best complete reasons for using a microcomputer in horticulture.

   a. To help make management (conclusions, decisions)

   b. To determine the profitability of the items (being grown, being selected) and marketed

4. List eight examples of software programs which might be used in horticulture.

   a. ____________________
   b. ____________________
   c. ____________________
   d. ____________________
   e. ____________________
   f. ____________________
   g. ____________________
   h. ____________________

5. Select sources of microcomputer software for horticulture by placing an "X" in the appropriate blanks.

_____a. Banks

_____b. Extension service

_____c. Garden centers

_____d. Agricultural magazines/newsletters

_____e. College of Agriculture departments

_____f. Commercial vendors

_____g. Service stations

_____h. Personal programming

## TEST

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

6. Determine specific sources of horticulture software.
7. Demonstrate the ability to run an application program related to horticulture (plant inventory).

# MICROCOMPUTER APPLICATIONS IN HORTICULTURE
## UNIT VII

## ANSWERS TO TEST

1. c. Fruit production
   d. Vegetable production

2. a, c, d, e, f, h, i, j, k, n, o, p

3. a. Decisions
   b. Being grown

4. Any eight of the following or ones discussed in class:

   a. Soil management practices
   b. Irrigation
   c. Light, ventilation, and temperature management
   d. Equipment
   e. Conditions for germination of seeds
   f. Seed treatment, rate, depth, and spacing of seeds
   g. Pruning schedules
   h. Landscape schedules
   i. Landscape design
   j. Cross-referencing
   k. Specifications for jobs
   l. Marketing procedures
   m. Profit and loss statements
   n. Budgets and estimating
   o. Chemical application
   p. Cost and growth analysis
   q. Inventory control

5. b, d, e, f, h

6. Evaluated to the satisfaction of the instructor

7. Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS

## UNIT OBJECTIVE

After completion of this unit, the student should be able to select people who use the microcomputer in agricultural mechanics applications, determine appropriate software for use in the area of agricultural mechanics, and run application programs. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment and job sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Select areas in agricultural mechanics where microcomputers might be used.
2. Select people who use the microcomputer in agricultural mechanics applications.
3. Select true statements concerning the reasons for using a microcomputer in agricultural mechanics applications.
4. List examples of software programs which might be used in agricultural mechanics.
5. Select sources of microcomputer software in agricultural mechanics.
6. Determine specific sources of agricultural mechanics software.
7. Demonstrate the ability to:
    a. Run an application program related to agricultural mechanics (calculating board feet).
    b. Run an application program related to agricultural mechanics (rafter dimensions).

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII

## SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information, assignment, and job sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Provide resources for use by the students when completing Assignment Sheet #1.

VI. Demonstrate and discuss procedures outlined in the job sheets.

VII. Provide access to computer for practicing the application programs.

VIII. Use advanced students as group leaders to work with students in running programs.

IX. Invite an equipment dealer to class to discuss the changes that have occurred since the introduction of the microprocessor/microcomputer to the manufacturing of large equipment.

X. Invite software dealers to demonstrate agricultural mechanics software.

XI. Demonstrate other types of software that can be used for agricultural mechanics applications.

XII. Show examples of some of the types of reports that can be received by using a microcomputer in agricultural mechanics.

XIII. Provide each student with adequate time to complete the accompanying software.

XIV. Have students run other software programs which are applicable to agricultural mechanics.

(NOTE: See resource list which is included in introductory material.)

XV. Give test.

XVI. Reteach if necessary.

XVII. Provide additional practice time if needed.

## INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Transparency masters

    1. TM 1 — People Who Use the Microcomputer in Agricultural Mechanics Applications

    2. TM 2 — Sources of Microcomputer Software (Agricultural Mechanics)

  D. Assignment Sheet #1 — Determine Specific Sources of Agricultural Mechanics Software

  E. Job sheets

    1. Job Sheet #1 — Run an Application Program Related to Agricultural Mechanics (Calculating Board Feet)

    2. Job Sheet #2 — Run an Application Program Related to Agricultural Mechanics (Rafter Dimensions)

  F. Test

  G. Answers to test

II. References:

  A. Phipps, Lloyd J. *Mechanics in Agriculture.* Danville, IL: The Interstate Printers and Publishers, Inc., 1977.

  B. Rush, Michael G. and Richard M. Foster. *Agricultural Mechanics.* Boise, ID: Idaho State Board of Vocational Education, 1981.

III. Additional materials:

  A. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984.

  B. Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.

  C. Beasley, Jack O. *Microcomputers on the Farm.* Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

  D. *Agricultural Computing Source Book.* St. Louis, MO: Doane Western, Inc., 1984.

## INSTRUCTIONAL MATERIALS

E. Agri-Education, Inc., 815 Shakespeare, Stratford, IA 50249.

(NOTE: Agri-Education, Inc., is a software distributor of agricultural computer programs designed for educational purposes. The following programs are available in agricultural mechanics.)

1. Deere (FMO) Machinery Management
2. Deere (FMO) Tractor

F. Microcomputer Programs in Agriculture. Vocational Agriculture Service, University of Illinois, 1401 S. Maryland Drive, Urbana, IL 61801.

(NOTE: The following programs are designed to run on the Commodore Pet, Apple II Plus, and Radio Shack TRS-80 Model III machines.)

1. Machinery Economic Decisions
2. Calibration of Field Sprayers
3. Greenhouse Heating and Cooling
4. Pearson Square Instructions
5. Pearson Square Calculations

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII

## INFORMATION SHEET

I. Areas in agricultural mechanics where microcomputers might be used

   A. Agricultural mechanics skills

      (NOTE: This includes areas such as selection, care, and correct use of shop tools and equipment, woodwork and simple carpentry, sheet metal work, elementary forge work, electric arc and oxyacetylene welding, pipe fitting, and simple plumbing repairs.)

   B. Agricultural power and machinery

      (NOTE: This includes selection, management, adjustment, operation, maintenance, and repair of engines, trucks, tractors, trailers, and machinery used in farming and agriculturally-oriented businesses and services.)

   C. Agricultural electrical power and processing

      (NOTE: This includes utilization of electricity in the home and in productive enterprises, in agribusiness, and selection, installation, operation, and maintenance of electrical equipment.)

   D. Agricultural structures

      (NOTE: This includes scale drawing and plan reading, farmstead and agribusiness layout, functional requirements of houses, shelters, and storages, water systems, and septic tanks and sewage disposals.)

   E. Soil and water management

      (NOTE: This includes leveling, land measurement and mapping, drainage, irrigation, terracing, and contouring.)

II. People who use the microcomputer in agricultural mechanics applications (Transparency 1)

   A. Farmers/ranchers

   B. Farm and ranch managers

   C. Tractor and equipment dealers

   D. Agricultural engineers

   E. Tractor and equipment manufacturers

## INFORMATION SHEET

F. Agribusiness managers

G. Vocational agriculture instructors

III. Reasons for using a microcomputer in agricultural mechanics applications

A. To maximize efficiency of farm machinery and equipment

(NOTE: Research has shown that as much as 85 percent of the farm and business machinery in operation is not properly adjusted. Just as many tractors and combines are already equipped with microprocessors to allow the operator to maintain the most efficient ground speeds, cylinder speeds, and engine RPMs. The farmer can also use a microcomputer to determine proper adjustment and equipment to be used for the appropriate jobs.)

B. To maintain accurate records

(NOTE: These records allow the farmer, rancher, and agribusiness person to analyze the information in order to make decisions. Some of these decisions might include purchase, maintenance, and marketing related to all areas of agricultural mechanics.)

C. To document financial information

(NOTE: This can help with the processing of income tax records and verifying financial records in order to establish credit and/or make investments.)

IV. Examples of software which might be used in agricultural mechanics

A. Calculating operating machine costs and break-even prices

B. Figuring depreciation

C. Calculating labor and fuel cost per hour/acre

D. Repair costs and schedules

E. Budgets

F. Controlling parts inventory

G. Comparison of ownership versus lease agreements

H. Controlling and monitoring tractor and combine operation

I. Monitoring engine operation and wear

J. Controlling ignition systems

## INFORMATION SHEET

K. Monitoring bearings and belts for overheating and wear

L. Monitoring grain for moisture content, machine damage, thrashing loss and yield

M. Calculating correct weight placement, tire size, and load for proper traction

N. Controlling grain handling equipment and dryers

O. Controlling milling and cutting machines and lathes

P. Controlling irrigation systems

Q. Controlling forage handling and storing systems

R. Controlling feeding systems

S. Designing equipment

T. Calculating foundation, roof, and wall loads for farm buildings

**(NOTE: The accompanying software for this unit includes programs for calculating board feet and rafter dimensions.)**

U. Determining lumber and steel needs

V. Calculating electricity and ventilation requirements

W. Controlling ventilation, lighting, water, feed, and other functions of buildings

X. Designing buildings

Y. Controlling robots

V. Sources of microcomputer software in agricultural mechanics (Transparency 2; Assignment Sheet #1)

A. Commercial vendors

B. College of Agriculture departments

C. Extension service

D. Computer user groups

E. Agricultural magazines/newsletters

## INFORMATION SHEET

F. Custom software

(NOTE: This is software which is developed for a specific use or purpose.)

G. Personal programming

(NOTE: By learning and using basic programming skills, an individual can develop new programs or adapt custom software to fit specific needs.)

H. Time-sharing systems

Examples: AGNET, CMNET, OASIS, SOURCE, AGRISTAR

# People Who Use the Microcomputer in Agricultural Mechanics Applications

Tractor and Equipment Manufacturers

Agricultural
Mechanics

Vo-Ag Instructors

Farmers and Ranchers

Tractor and Equipment Dealers

Farm and Ranch Managers

Agribusiness Managers

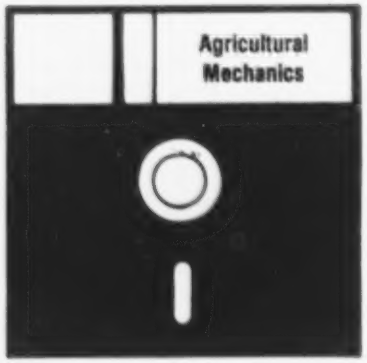
Agricultural Engineers

# Sources of Microcomputer Software (Agricultural Mechanics)

College of Agriculture Departments

Commercial Vendors

Computer User Groups



Custom Software

Extension Service

Personal Programming

Time-Sharing Systems

Agricultural Magazines/Newsletters

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII

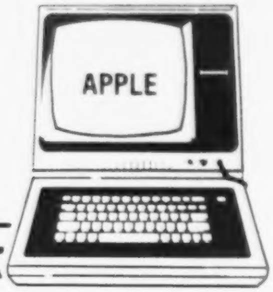
## ASSIGNMENT SHEET #1 — DETERMINE SPECIFIC SOURCES OF AGRICULTURAL MECHANICS SOFTWARE

Directions: Determine specific sources of agricultural mechanics software which are readily available in your area. Be specific with information which will help you in obtaining the actual software when its use becomes necessary. Use the form provided on the back of this page to complete the assignment.

## ASSIGNMENT SHEET #1

| SOURCES OF SOFTWARE (Company name, address, phone, and contact person) | NAME OF PROGRAM | HARDWARE REQUIRED | PURPOSE OF SOFTWARE | COST | FEATURES |
|---|---|---|---|---|---|
| | | | | | |

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII



### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO AGRICULTURAL MECHANICS (CALCULATING BOARD FEET)

I. Equipment and materials needed

  A. Microcomputer

  (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

  B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

  A. Insert the diskette in Disk Drive 1

  B. Close the disk drive door

  C. Turn on the computer

  (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

  D. Type the number [13] designating the "Calculating Board Feet" program and press [RETURN]

  E. Follow the procedures outlined in the program

  F. Complete the following problems

## JOB SHEET #1

PROBLEM #1: Determine the total board feet and the cost using the following information.

1. Number of sizes of boards needed — 1
2. Thickness of boards — 2 inches
3. Width of boards — 6 inches
4. All boards are the same length — 12 feet
5. Cost per board foot — $.75
6. Number of boards — 10

TOTAL BOARD FEET AND COST

| SIZE | BOARD FEET | | COST |
|---|---|---|---|
| ________ | ____________ | | ________ |
| | | TOTAL | ________ |

PROBLEM #2: Determine the total board feet and the cost using the following information. Call a local lumber yard to obtain the current cost per board foot.

(NOTE: The figures below are presented as the number of pieces, the thickness, and width, and the length.)

1. 10 — 2" × 6" × 12'
2. 5 — 2" × 4" × 8'
3. 7 — 2" × 4" × 12'
4. 20 — 1" × 4" × 10'

TOTAL BOARD FEET AND COST

| SIZE | BOARD FEET | | COST |
|---|---|---|---|
| ________ | ____________ | | ________ |
| ________ | ____________ | | ________ |
| ________ | ____________ | | ________ |
| | | TOTAL | ________ |

PROBLEM #3: Using information from the home or farm or from an example given to you by your instructor, calculate the board feet needed and total cost of the project.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII

RADIO
SHACK

### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO AGRICULTURAL MECHANICS (CALCULATING BOARD FEET)

I. Equipment and materials needed

   A. Microcomputer

      (NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

   B. Accompanying software

      (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Turn the computer on

      (NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

   B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

      **(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

   C. Close the disk drive door

   D. Press the [RESET] button

      (NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

   E. Enter the date and press [ENTER]

      Example: May 5, 1985 would be written as 05/05/85

   F. Enter the time or, if you wish to bypass this step, press [ENTER]

## JOB SHEET #1

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [13] designating the "Calculating Board Feet" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

PROBLEM #1: Determine the total board feet and the cost using the following information.

1. Number of sizes of boards needed — 1
2. Thickness of boards — 2 inches
3. Width of boards — 6 inches
4. All boards are the same length — 12 feet
5. Cost per board foot — $.75
6. Number of boards — 10

TOTAL BOARD FEET AND COST

| SIZE | BOARD FEET | | COST |
|---|---|---|---|
| ________ | ____________ | | ________ |
| | | TOTAL | ________ |

## JOB SHEET #1

PROBLEM #2: Determine the total board feet and the cost using the following information. Call a local lumber yard to obtain the current cost per board foot.

(NOTE: The figures below are presented as the number of pieces, the thickness, and width, and the length.)

1. 10 — 2″ × 6″ × 12′
2. 5 — 2″ × 4″ × 8′
3. 7 — 2″ × 4″ × 12′
4. 20 — 1″ × 4″ × 10′

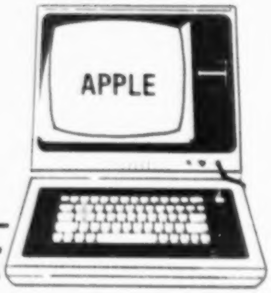
TOTAL BOARD FEET AND COST

| SIZE | BOARD FEET | | COST |
|---|---|---|---|
| ________ | ____________ | | ________ |
| ________ | ____________ | | ________ |
| ________ | ____________ | | ________ |
| | | TOTAL | ________ |

PROBLEM #3: Using information from the home or farm or from an example given to you by your instructor, calculate the board feet needed and total cost of the project.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII



## JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO AGRICULTURAL MECHANICS (RAFTER DIMENSIONS)

I. Equipment and materials needed

   A. Microcomputer

      (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

   B. Accompanying software

      (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Insert the diskette in Disk Drive 1

   B. Close the disk drive door

   C. Turn on the computer

      (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

   D. Type the number [14] designating the "Rafter Dimensions" program and press [RETURN]

   E. Follow the procedures outlined in the program

   F. Complete the following problems

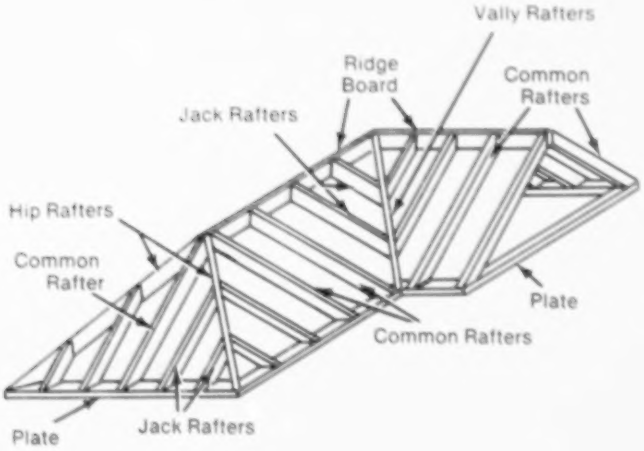
# JOB SHEET #2

PROBLEM #1: Determine the rafter dimensions using the following building measurements.

Total width of building is **40 feet**.
Pitch of roof is $^{5}/_{12}$.
Eave will project **3 feet**.

Length of common rafter ________
Extra length for overhang ________
Length of hip or valley rafter ________
Overhang length of hip/valley rafter ________
Difference in length of jack rafters spaced 16 inches on center ________
Difference in length of jack rafters spaced 24 inches on center ________
Side cut of jack rafter ________
Side cut of hip/valley rafter ________

W-truss rafters
Rafter tie — 3 parts ________ inches long.
Common rafter — 2 parts ________ inches long.


Vally Rafters
Ridge Board
Common Rafters
Jack Rafters
Hip Rafters
Common Rafter
Plate
Common Rafters
Plate
Jack Rafters

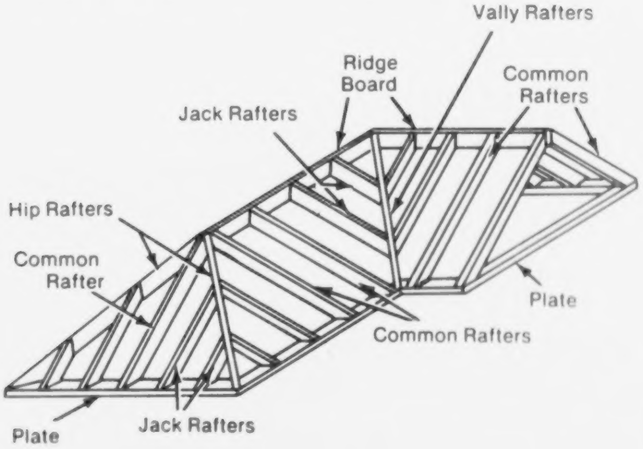
## JOB SHEET #2

PROBLEM #2: Determine the rafter dimensions using the following building measurements.

Total width of building is **32 feet**.
Pitch of roof is 4/12.
Eave will project **2 feet**.

Length of common rafter ____________
Extra length for overhang ____________
Length of hip or valley rafter ____________
Overhang length of hip/valley rafter ____________
Difference in length of jack rafters spaced 16 inches on center ____________
Difference in length of jack rafters spaced 24 inches on center ____________
Side cut of jack rafter ____________
Side cut of hip/valley rafter ____________

W-truss rafters ____________
Rafter tie — 3 parts ____________ inches long.
Common rafter — 2 parts ____________ inches long.


Vally Rafters
Ridge Board
Common Rafters
Jack Rafters
Hip Rafters
Common Rafter
Plate
Common Rafters
Plate
Jack Rafters

PROBLEM #3: Using information from home or farm or from an example given to you by your instructor, calculate rafter dimensions.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII

RADIO
SHACK

### JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO AGRICULTURAL MECHANICS (RAFTER DIMENSIONS)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either a Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

F. Enter the time or, if you wish to bypass this step, press [ENTER]

## JOB SHEET #2

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [14] designating the "Rafter Dimensions" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

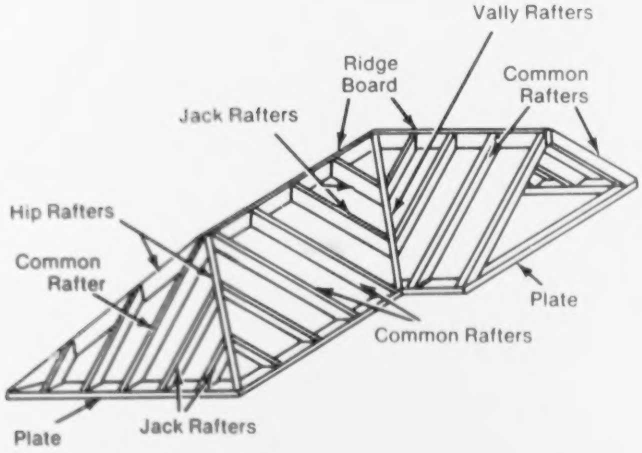
PROBLEM #1: Determine the rafter dimensions using the following building measurements.

Total width of building is **40 feet**.
Pitch of roof is **$^5/_{12}$**.
Eave will project **3 feet**.

Length of common rafter ____________
Extra length for overhang ____________
Length of hip or valley rafter ____________
Overhang length of hip/valley rafter ____________
Difference in length of jack rafters spaced 16 inches on center ____________
Difference in length of jack rafters spaced 24 inches on center ____________
Side cut of jack rafter ____________
Side cut of hip/valley rafter ____________

W-truss rafters ____________
Rafter tie — 3 parts ____________ inches long.
Common rafter — 2 parts ____________ inches long.

## JOB SHEET #2


Vally Rafters
Ridge Board
Common Rafters
Jack Rafters
Hip Rafters
Common Rafter
Plate
Common Rafters
Plate
Jack Rafters

**PROBLEM #2:** Determine the rafter dimensions using the following building measurements.

Total width of building is **32 feet**.
Pitch of roof is $^{4}/_{12}$.
Eave will project **2 feet**.

Length of common rafter ____________
Extra length for overhang ____________
Length of hip or valley rafter ____________
Overhang length of hip/valley rafter ____________
Difference in length of jack rafters spaced 16 inches on center ____________
Difference in length of jack rafters spaced 24 inches on center ____________
Side cut of jack rafter ____________
Side cut of hip/valley rafter ____________

W-truss rafters ____________
Rafter tie — 3 parts ____________ inches long.
Common rafter — 2 parts ____________ inches long.

**PROBLEM #3:** Using information from home or farm or from an example given to you by your instructor, calculate rafter dimensions.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
# UNIT VIII

## ANSWERS TO JOB SHEET PROBLEMS

### JOB SHEET #1

Problem #1

TOTAL BOARD FEET AND C

| SIZE | BOARD FEET | COST |
|---|---|---|
| 1 by 6 | 60 | $45 |
| | TOTAL | $45 |

Problem #2 — Performance skills evaluated to the satisfaction of the instructor

Problem #3 — Performance skills evaluated to the satisfaction of the instructor

### JOB SHEET #2

Problem #1

| | |
|---|---|
| Length of common rafter | **260 inches** |
| Extra length for overhang | **39 inches** |
| Length of hip or valley rafter | **353.8 inches** |
| Overhang length of hip/valley rafter | **53.07 inches** |
| Difference in length of jack rafters spaced 16 inches on center | **17.31 inches** |
| Difference in length of jack rafters spaced 24 inches on center | **26 inches** |
| Side cut of jack rafter | **11.06 inches** |
| Side cut of hip/valley rafter | **11.5 inches** |

W-truss rafters
Rafter tie — 3 parts **160 inches** long.
Common rafter — 2 parts **130 inches** long.

## ANSWERS TO JOB SHEET PROBLEMS

Problem #2

| | |
|---|---|
| Length of common rafter | **202.4 inches** |
| Extra length for overhang | **25.3 inches** |
| Length of hip or valley rafter | **279.04 inches** |
| Overhang length of hip/valley rafter | **34.88 inches** |
| Difference in length of jack rafters spaced 16 inches on center | **16.88 inches** |
| Difference in length of jack rafters spaced 24 inches on center | **25.31 inches** |
| Side cut of jack rafter | **11.37 inches** |
| Side cut of hip/valley rafter | **11.69 inches** |

W-truss rafters
Rafter tie — 3 parts **128 inches** long.
Common rafter — 2 parts **101.2 inches** long.

Problem #3 — Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII

NAME ______________________

## TEST

1. Select areas in agricultural mechanics where microcomputers might be used by placing an "X" in the appropriate blanks.

    _____a. Vegetable production

    _____b. Agricultural structures

    _____c. Soil and water management

    _____d. Animal science

    _____e. Crop science

    _____f. Agricultural mechanics skills

    _____g. Agricultural power and machinery

    _____h. Agricultural electrical power and processing

    _____i. Feeds and nutrition

2. Select people who use the microcomputer in agricultural mechanics applications by placing an "X" in the appropriate blanks.

    _____a. Farm building designers and manufacturers

    _____b. Agriculture engineers

    _____c. Farmers/ranchers

    _____d. Vocational agriculture instructors

    _____e. Tractor and equipment dealers

    _____f. Tractor and equipment manufacturers

3. Select true statements concerning the reasons for using a microcomputer in agricultural mechanics applications by placing an "X" in the appropriate blanks.

    _____a. To maintain accurate records

    _____b. To minimize efficiency of farm machinery and equipment

    _____c. To gather descriptive information

    _____d. To document financial information

## TEST

4. List six examples of software which might be used in agricultural mechanics.

   a. ______________________________

   b. ______________________________

   c. ______________________________

   d. ______________________________

   e. ______________________________

   f. ______________________________

5. Select sources of microcomputer software in agricultural mechanics by placing an "X" in the appropriate blanks.

   _____a. Newspapers

   _____b. Custom software

   _____c. Service stations

   _____d. Time-sharing systems

   _____e. Agricultural magazines/newsletters

   _____f. Extension service

   _____g. Computer user groups

   _____h. Home economics departments

   _____i. Commercial vendors

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

6. Determine specific sources of agricultural mechanics software.

7. Demonstrate the ability to:

   a. Run an application program related to agricultural mechanics (calculating board feet).

   b. Run an application program related to agricultural mechanics (rafter dimensions).

# MICROCOMPUTER APPLICATIONS IN AGRICULTURAL MECHANICS
## UNIT VIII

## ANSWERS TO TEST

1. b, c, f, g, h

2. All are correct

3. a, d

4. Any six of the following or ones discussed in class:

   a. Calculating operating machine costs and break-even prices
   b. Figuring depreciation
   c. Calculating labor and fuel costs per hour/acre
   d. Repair costs and schedules
   e. Budgets
   f. Controlling parts inventory
   g. Comparison of ownership versus lease agreements
   h. Controlling and monitoring tractor and combine operation
   i. Monitoring engine operation and wear
   j. Controlling ignition systems
   k. Monitoring bearings and belts for overheating and wear
   l. Monitoring grain for moisture content, machine damage, thrashing loss and yield
   m. Calculating correct weight placement, tire size, and load for proper traction
   n. Controlling grain handling equipment and dryers
   o. Controlling milling and cutting machines and lathes
   p. Controlling irrigation systems
   q. Controlling forage handling and storing systems
   r. Controlling feeding systems
   s. Designing equipment
   t. Calculating foundation, roof, and wall loads for farm buildings
   u. Determining lumber and steel needs
   v. Calculating electricity and ventilation requirements
   w. Controlling ventilation, lighting, water, feed, and other functions of buildings
   x. Designing buildings
   y. Controlling robots

5. b, d, e, f, g, i

6. Evaluated to the satisfaction of the instructor

7. Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS

## UNIT OBJECTIVE

After completion of this unit, the student should be able to select agribusiness career fields where a microcomputer is used, determine appropriate software for use in agribusiness, and run application programs. This knowledge will be evidenced by correctly performing the procedures outlined in the assignment and job sheets and by scoring 85 percent on the unit test.

## SPECIFIC OBJECTIVE

After completion of this unit, the student should be able to:

1. Select agribusiness career fields where a microcomputer is used.
2. Complete a list of reasons for using a microcomputer in agribusiness.
3. Select true statements concerning ways the microcomputer can improve the profit margin.
4. List ways the microcomputer is used in agribusiness.
5. Complete a list of sources of microcomputer software in agribusiness.
6. Determine specific sources of agribusiness software.
7. Demonstrate the ability to:
    a. Run an application program related to agribusiness (computing interest).
    b. Run an application program related to agribusiness (take home pay).

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX

## SUGGESTED ACTIVITIES

I. Provide students with objective sheet.

II. Provide students with information, assignment, and job sheets.

III. Discuss unit and specific objectives.

IV. Discuss information and assignment sheets.

V. Demonstrate and discuss procedures outlined in the job sheets.

VI. Provide resources for the students to use in completing Assignment Sheet #1.

VII. Provide access to computer for practice in running the application programs.

VIII. Use advanced students as group leaders to work with students in running programs.

IX. Take students on a field trip to an agribusiness where microcomputers are used.

X. Invite owner/manager of a local agribusiness to class to discuss the ways a microcomputer is used in business.

(NOTE: Have this individual bring examples of various reports which are obtained from the microcomputer.)

XI. Invite the school's business and office instructor to class to show ways the microcomputer is being used in business applications.

XII. Lead a class discussion on ways the microcomputer can be used in making decisions regarding goals and objectives for one interested in starting a new business.

XIII. Have students bring examples of items which are produced by a microcomputer in an agribusiness to class.

Examples: Receipts, sales tickets, statements, grain storage records

XIV. Provide each student with adequate time to complete the accompanying software.

XV. Have students run other software programs which are applicable to agribusiness.

(NOTE: See resource list which is included in introductory material.)

## SUGGESTED ACTIVITIES

XVI. Give test.

XVII. Reteach if necessary.

XVIII. Provide additional practice time if needed.

## INSTRUCTIONAL MATERIALS

I. Included in this unit:

  A. Objective sheet

  B. Information sheet

  C. Transparency masters

    1. TM 1 — Ways the Microcomputer is Used in Agribusiness

    2. TM 2 — Sources of Microcomputer Software (Agribusiness)

  D. Assignment Sheet #1 — Determine Specific Sources of Agribusiness Software

  E. Job sheets

    1. Job Sheet #1 — Run an Application Program Related to Agribusiness (Computing Interest)

    2. Job Sheet #2 — Run an Application Program Related to Agribusiness (Take Home Pay)

  F. Test

  G. Answers to test

II. Reference — Stone, Archie A., Marcella L. Stone, and Harold E. Gulvin. *Agribusiness and Industry.* Danville, IL: The Interstate Printers and Publishers, Inc., 1980.

III. Additional materials:

  A. Legacy, James, Tom Stitt, and Fred Reneau. *Microcomputing in Agriculture.* Reston, VA: Reston Publishing Co., Inc., 1984.

  B. Sonka, Steven T. *Computers in Farming.* New York: McGraw-Hill Book Co., 1983.

## INSTRUCTIONAL MATERIALS

C. Beasley, Jack O. *Microcomputers on the Farm*. Indianapolis, IN: Howard W. Sams and Co., Inc., 1983.

D. *Agricultural Computing Source Book*. St. Louis, MO: Doane Western, Inc., 1984.

E. Microcomputer Programs in Agriculture. Vocational Agriculture Service, University of Illinois, 1401 S. Maryland Drive, Urbana, IL 61801.

(NOTE: The following programs are designed to run on the Commodore Pet, Apple II Plus, and Radio Shack TRS-80 Model III machines.)

1. Income Possibilities
2. Depreciation Program
3. Cash Flow
4. Grain Marketing

# MICROCOMPUTER APPLICATIONS IN
# AGRIBUSINESS
# UNIT IX

## INFORMATION SHEET

I. Agribusiness career fields where a microcomputer is used

  A. Manufacturing and processing

  (NOTE: These include refining raw materials from the farm into finished food and fiber products and manufacturing production materials, supplies, and equipment for farmers and ranchers.)

  B. Distribution

  (NOTE: Finished products must be distributed to dealers and must be on hand and ready for the consumers when they want them. Distribution includes the areas of transportation services, wholesale and terminal markets, warehousing and storage, and retail outlets.)

  C. Services for agribusiness

  Examples: Banking, insurance, farm organizations, advertising, storage of farm commodities, tax managers, equipment dealers, feed dealers

  D. Government services

  (NOTE: Besides the U.S. Department of Agriculture, which is the largest employer, each state and county employs one or more people who serve in the non-farm activities of agriculture.)

  E. Professional and scientific services

  Examples: Economists, agronomists, nutritionists, veterinarians, agricultural consultants, vocational agriculture instructors

  F. Sales

  (NOTE: Sales will include the selling of agricultural products at wholesale and retail levels. Sales can occur in all career fields.)

II. Reasons for using a microcomputer in agribusiness

  A. To determine the profitability of goods and services

  B. To process income tax financial reports

  C. To help verify information needed to establish credit and/or make investments

INFORMATION SHEET

D. To assist in making decisions

(NOTE: Before either goods or services are delivered to the customers, many decisions are made such as types of goods or services to offer, greatest efficiency, largest yield, highest margin of profit, when to sell, etc.)

E. To improve the efficiency of providing data to customers

(NOTE: Many of the careers in agribusiness depend upon being able to respond to requests for information from consumers. Ready access to this data can expedite the return of the information for their use. Examples include insurance, USDA, customer service, banking, and grain storage.)

F. To control equipment and facilities

(NOTE: Many agribusinesses use computers to run augers, dryers, and their security system, to maintain environmental conditions, and to improve company efficiency through the use of robots.)

G. To assist in chemical selection

III. Ways the microcomputer can improve the profit margin

A. Improves effectiveness of using existing labor

B. Controls inventory

(NOTE: By reducing inventory stock, lower interest is paid.)

C. Identifies high risk customers

D. Improves employee accuracy

E. Increases the effectiveness of advertising

F. Provides information to eliminate seldom sold products and low profit items

IV. Ways the microcomputer is used in agribusiness (Transparency 1)

(NOTE: The following list includes only a few of the many ways a microcomputer may be used in agribusiness.)

A. Provides financial record keeping

1. Monthly and annual reports

2. Customer financial reports

INFORMATION SHEET

3. Tax reports

4. Item profitability reports

B. Provides inventory information

1. Orders new stock when needed

2. Maintains a daily inventory status report

3. Lowers inventory needs and investment

4. Maintains higher quality products by producing faster item turnover

C. Provides in-house record keeping

1. Payroll

**(NOTE: The accompanying software for this unit includes a program for figuring take home pay.)**

2. Department transfers

3. Employee scheduling

4. Employee purchases

D. Provides customer services and communication

1. Itemized billing

**(NOTE: The accompanying software for this unit includes a program for computing interest.)**

2. Quicker credit analysis

3. Faster service by identifying items on hand and location

4. Word processing

5. Direct mailings of advertisements

E. Provides tax and accounting services

Examples: Social Security, sales tax

## INFORMATION SHEET

F. Controls equipment

Examples: Heating and air conditioning, lights, security system, equipment specific to the business

G. Performs jobs specific to the business

1. Formulates feed rations

2. Calculates pesticides and fertilizer rates

3. Provides communication to warehouses for quick ordering

4. Provides market news and reports

V. Sources of microcomputer software in agribusiness (Transparency 2; Assignment Sheet #1)

A. Commercial vendors

B. College of Agriculture departments

C. Extension service

D. Computer user groups

E. Agricultural magazines/newsletters

F. Custom software

(NOTE: This is software which is developed for a specific use or purpose.)

G. Personal programming

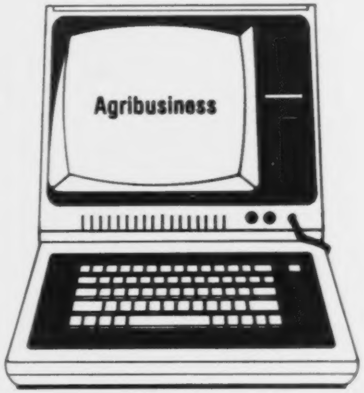
(NOTE: By learning and using basic programming skills, an individual can develop new programs or adapt custom software to fit specific needs.)

H. Time-sharing systems

Examples: AGNET, CMNET, OASIS, SOURCE

# Ways the Microcomputer is Used in Agribusiness

Provides Customer Services and Communications



Provides In-House Record Keeping

Controls Equipment

Provides Inventory Information

Provides Financial Record Keeping

Perform Jobs Specific to the Business

Provides Tax and Accounting Services

# Sources of Microcomputer Software (Agribusiness)

College of Agriculture Departments

Commercial Vendors

Computer User Groups

Agribusiness

Custom Software

Extension Service

Personal Programming

Time-Sharing Systems

Agricultural Magazines/Newsletters

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX

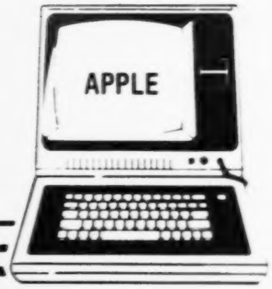
## ASSIGNMENT SHEET #1 — DETERMINE SPECIFIC SOURCES OF AGRIBUSINESS SOFTWARE

Directions: Determine specific sources of agribusiness software which are readily available in your area. Be specific with information which will help you in obtaining the actual software when its use becomes necessary. Use the form provided on the back of this page to complete the assignment.

## ASSIGNMENT SHEET #1

| SOURCES OF SOFTWARE (Company name, address, phone, and contact person) | NAME OF PROGRAM | HARDWARE REQUIRED | PURPOSE OF SOFTWARE | COST | FEATURES |
|---|---|---|---|---|---|
| | | | | | |

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX



### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO AGRIBUSINESS (COMPUTING INTEREST)

I. Equipment and materials needed

- A. Microcomputer

  (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

- B. Accompanying software

  (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

- A. Insert the diskette in Disk Drive 1
- B. Close the disk drive door
- C. Turn on the computer

  (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

- D. Type the number [15] designating the "Computing Interest" program and press [RETURN]
- E. Follow the procedures outlined in the program
- F. Complete the following problems

## JOB SHEET #1

PROBLEM #1: Determine the amount of principle and interest you would pay for a livestock feed loan under the following conditions.

1. The name of the loan is "(YOUR NAME) FEED LOAN".
2. The interest rate is 14.75%.
3. The amount of the loan is $1000.00.
4. There will be 6 payments, due on the 1st of each month.
5. All payments will be the same — $173.00.
6. You borrowed the money on April 15, so the first payment is due 15 days (May 1).
7. May has 31 days, June has 30 days, etc.

USING THESE FIGURES, CALCULATE THE FOLLOWING:

LOAN NAME ______________________________________________

| PAYMENT NUMBER | INTEREST PAID | PRINCIPLE PAID | BALANCE REMAINING |
|---|---|---|---|
| #1 | ________ | ________ | ________ |
| #2 | ________ | ________ | ________ |
| #3 | ________ | ________ | ________ |
| #4 | ________ | ________ | ________ |
| #5 | ________ | ________ | ________ |
| #6 | ________ | ________ | ________ |

PROBLEM #2: Using information from your own farming program or from an example given to you by your instructor, calculate principle and interest table for a loan. Use accurate information from your SOE records or from a real bank loan for your inputs if possible.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX

RADIO
SHACK

### JOB SHEET #1 — RUN AN APPLICATION PROGRAM RELATED TO AGRIBUSINESS (COMPUTING INTEREST)

I. Equipment and materials needed

A. Microcomputer

(NOTE: This job sheet has been designed to be used with either Radio Shack, Model III or IV microcomputer.)

B. Accompanying software

(NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

A. Turn the computer on

(NOTE: After turning on the computer, you will see a red light which indicates the disk drive motors are running. WAIT for this light to go off before proceeding to the next step.)

B. Holding the diskette with the label side up and the read/write window pointing into the drive slot, insert into the lower disk drive

**(CAUTION: Do not force the diskette; rather, slide it gently into the opening.)**

C. Close the disk drive door

D. Press the [RESET] button

(NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

E. Enter the date and press [ENTER]

Example: May 5, 1985 would be written as 05/05/85

F. Enter the time or, if you wish to bypass this step, press [ENTER]

## JOB SHEET #1

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [15] designating the "Computing Interest" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

PROBLEM #1: Determine the amount of principle and interest you would pay for a livestock feed loan under the following conditions.

1. The name of the loan is "(YOUR NAME) FEED LOAN".
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USING THESE FIGURES, CALCULATE THE FOLLOWING:

LOAN NAME ______________________________

| PAYMENT NUMBER | INTEREST PAID | PRINCIPLE PAID | BALANCE REMAINING |
|---|---|---|---|
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| #3 | ________ | ________ | ________ |
| #4 | ________ | ________ | ________ |
| #5 | ________ | ________ | ________ |
| #6 | ________ | ________ | ________ |

PROBLEM #2: Using information from your own farming program or from an example given to you by your instructor, calculate principle and interest table for a loan. Use accurate information from your SOE records or from a real bank loan for your inputs if possible.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
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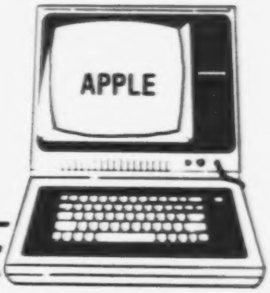

### JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO AGRIBUSINESS (TAKE HOME PAY)

I. Equipment and materials needed

   A. Microcomputer

   (NOTE: This job sheet has been designed to be used with any of the APPLE II compatible models.)

   B. Accompanying software

   (NOTE: Be sure to use the appropriate software designed for use with your microcomputer.)

II. Procedure

   A. Insert the diskette in Disk Drive 1

   B. Close the disk drive door

   C. Turn on the computer

   (NOTE: The diskette will self-boot. If not, type [PR#6]. This will put the menu on the screen.)

   D. Type the number [16] designating the "Take Home Pay" program and press [RETURN]

   E. Follow the procedures outlined in the program

   F. Complete the following problems

## JOB SHEET #2

PROBLEM #1: Determine the amount of take home pay when given the following information.

1. Total payment period (weekly, monthly, etc.) — $450
2. Amount of state and federal taxes withheld — $63
3. Amount of FICA deduction — $31
4. Amount of deductions for insurance, etc. — $13
5. Any other deductions — 0
6. Payment is received monthly

### ESTIMATED PAY AND ANNUAL DEDUCTIONS

Total (Gross) annual pay ________
Annual deduction for taxes ________
Annual deduction for FICA ________
Annual deduction for insurance, dues, retirements, etc. ________
Annual other deductions ________
Total annual deductions ________

Annual take home pay ________
Take home pay per pay period ________

PROBLEM #2: Apply the information from your personal salary or from information provided by your instructor to figure take home pay.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX

RADIO
SHACK

### JOB SHEET #2 — RUN AN APPLICATION PROGRAM RELATED TO AGRIBUSINESS (TAKE HOME PAY)

I. Equipment and materials needed

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   D. Press the [RESET] button

   (NOTE: The RESET button is the orange square located on the upper right side of the keyboard. Wait for the red light to go off before proceeding to the next step.)

   E. Enter the date and press [ENTER]

   Example: May 5, 1985 would be written as 05/05/85

   F. Enter the time or, if you wish to bypass this step, press [ENTER]

## JOB SHEET #2

G. When TRSDOS Ready appears on the screen, type [BASIC] and press [ENTER]

H. When "How Many Files?" appears on the screen, press [ENTER]

I. When "Memory Size?" appears on the screen, press [ENTER] again

J. When the READY prompt appears, type [RUN "HELLO"] and press [ENTER]

K. Type the number [16] designating the "Take Home Pay" program and press [ENTER]

L. Follow the procedures outlined in the program

M. Complete the following problems

PROBLEM #1: Determine the amount of take home pay when given the following information.

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5. Any other deductions — 0
6. Payment is received monthly

### ESTIMATED PAY AND ANNUAL DEDUCTIONS

Total (Gross) annual pay __________
Annual deduction for taxes __________
Annual deduction for FICA __________
Annual deduction for insurance, dues, retirements, etc. __________
Annual other deductions __________
Total annual deductions __________

Annual take home pay __________
Take home pay per pay period __________

PROBLEM #2: Apply the information from your personal salary or from information provided by your instructor to figure take home pay.

(NOTE: When you have completed the program, do not forget to replace the diskette in its protective jacket and file for later use.)

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX

## ANSWERS TO JOB SHEET PROBLEMS

### JOB SHEET #1

Problem #1

| PAYMENT NUMBER | INTEREST PAID | PRINCIPLE PAID | BALANCE REMAINING |
|---|---|---|---|
| #1 | 6.06 | 166.94 | 833.06 |
| #2 | 10.44 | 162.56 | 670.50 |
| #3 | 8.13 | 164.87 | 505.63 |
| #4 | 6.33 | 166.67 | 338.96 |
| #5 | 4.11 | 168.89 | 170.07 |
| #6 | 2.13 | 170.87 | - .8 |

Problem #2 — Performance skills evaluated to the satisfaction of the instructor

### JOB SHEET #2

Problem #1

ESTIMATED PAY AND ANNUAL DEDUCTIONS

| | |
|---|---|
| Total (Gross) annual pay | 5400 |
| Annual deduction for taxes | 756 |
| Annual deduction for FICA | 372 |
| Annual deduction for insurance, dues, retirements, etc. | 156 |
| Annual other deductions | 0 |
| Total annual deductions | 1284 |
| Annual take home pay | 4116 |
| Take home pay per pay period | 343 |

Problem #2 — Performance skills evaluated to the satisfaction of the instructor

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX

NAME ______________________

## TEST

1. Select agribusiness career fields where a microcomputer is used by placing an "X" in the appropriate blanks.

   _____a. Distribution

   _____b. Professional and scientific services

   _____c. Services for agribusiness

   _____d. Services for production

   _____e. Marketing

   _____f. Government services

   _____g. Collection agencies

   _____h. Manufacturing and processing

   _____i. Sales

2. Complete the following list of reasons for using a microcomputer in agribusiness.

   a. To improve the efficiency of providing ____________________ to customers

   b. To determine the ____________________ of goods and services

   c. To assist in ____________________ decisions

   d. To process ____________________ tax financial reports

   e. To help verify information needed to establish ____________________ and/or make investments

   f. To control ____________________ and facilities

   g. To assist in ____________________ selection

## TEST

3. Select true statements concerning ways the microcomputer can improve the profit margin by placing an "X" in the appropriate blanks.

_____a. Improves effectiveness of using existing labor

_____b. Eliminates high risk customers

_____c. Controls inventory

_____d. Provides information to eliminate seldom sold products and low profit items

_____e. Eliminates the need for advertising

4. List six ways the microcomputer is used in agribusiness.

a. ______________________________

b. ______________________________

c. ______________________________

d. ______________________________

e. ______________________________

f. ______________________________

5. Complete the following list of sources of microcomputer software in agribusiness.

a. Time-sharing systems

b. Computer user groups

c. Commercial vendors

d. College of Agriculture departments

e. ______________________________

f. ______________________________

g. ______________________________

h. ______________________________

# TEST

(NOTE: If the following activities have not been accomplished prior to the test, ask your instructor when they should be completed.)

6. Determine specific sources of agribusiness software.

7. Demonstrate the ability to:

    a. Run an application program related to agribusiness (computing interest).

    b. Run an application program related to agribusiness (take home pay).

# MICROCOMPUTER APPLICATIONS IN AGRIBUSINESS
## UNIT IX

## ANSWERS TO TEST

1. a, b, c, f, h, i

2. a. Data
   b. Profitability
   c. Making
   d. Income
   e. Credit
   f. Equipment
   g. Chemical

3. a, c, d

4. Any six of the following or ones discussed in class:

   a. Provides financial record keeping
   b. Monthly and annual reports
   c. Customer financial reports
   d. Tax reports
   e. Item profitability reports
   f. Provides inventory information
   g. Orders new stock when needed
   h. Maintains a daily inventory status report
   i. Lowers inventory needs and investment
   j. Maintains higher quality products by producing faster item turnover
   k. Provides in-house record keeping
   l. Payroll
   m. Department transfers
   n. Employee scheduling
   o. Employee purchases
   p. Provides customer services and communication
   q. Itemized billing
   r. Quicker credit analysis
   s. Faster service by identifying items on hand and location
   t. Word processing
   u. Direct mailings of advertisements
   v. Provides tax and accounting services
   w. Controls equipment
   x. Performs jobs specific to the business
   y. Formulates feed rations
   z. Calculates pesticide and fertilizer rates
   aa. Provides communication to warehouses for quick ordering
   bb. Provides market news and reports

5. e. Extension service
   f. Agricultural magazines/newsletters
   g. Custom software
   h. Personal programming

## ANSWERS TO TEST

6. Evaluated to the satisfaction of the instructor

7. Performance skills evaluated to the satisfaction of the instructor